ZDDOMG
Zero Downtime Deploys for Online Multiplayer Games

Tools Inventory

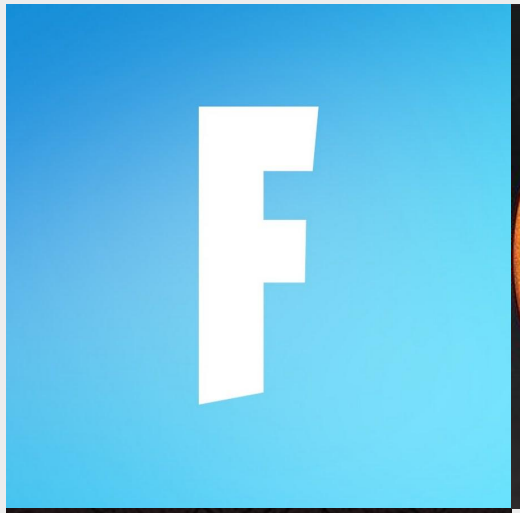
https://goo.gl/forms/yptOxB9T3UctK5LX2

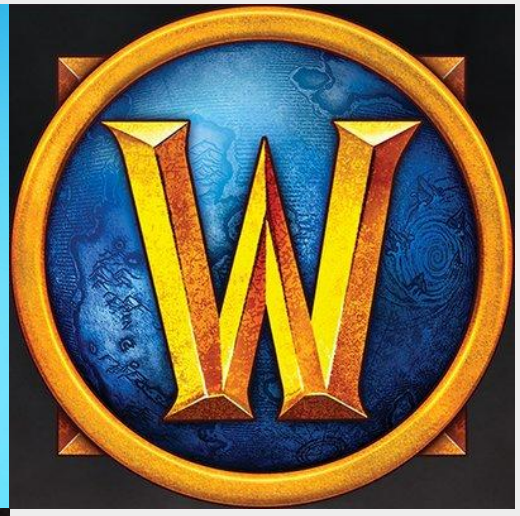
TUE 08/28 12:00 PM - 1:00 PM GRAND I

Using our flagship game (Vainglory) as a case study, we review how to evolve an online game from patch downtimes to zero downtime deploys with special emphasis on the challenges created by mobile app store distribution and the limitations of a small team.

Fortnite

August 7th: 2 hours



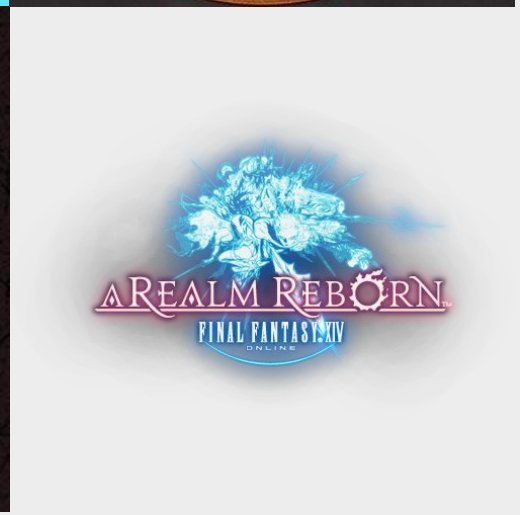


World of Warcraft

August 21st: 1 hour

PUBG

August 1st: 2 hours

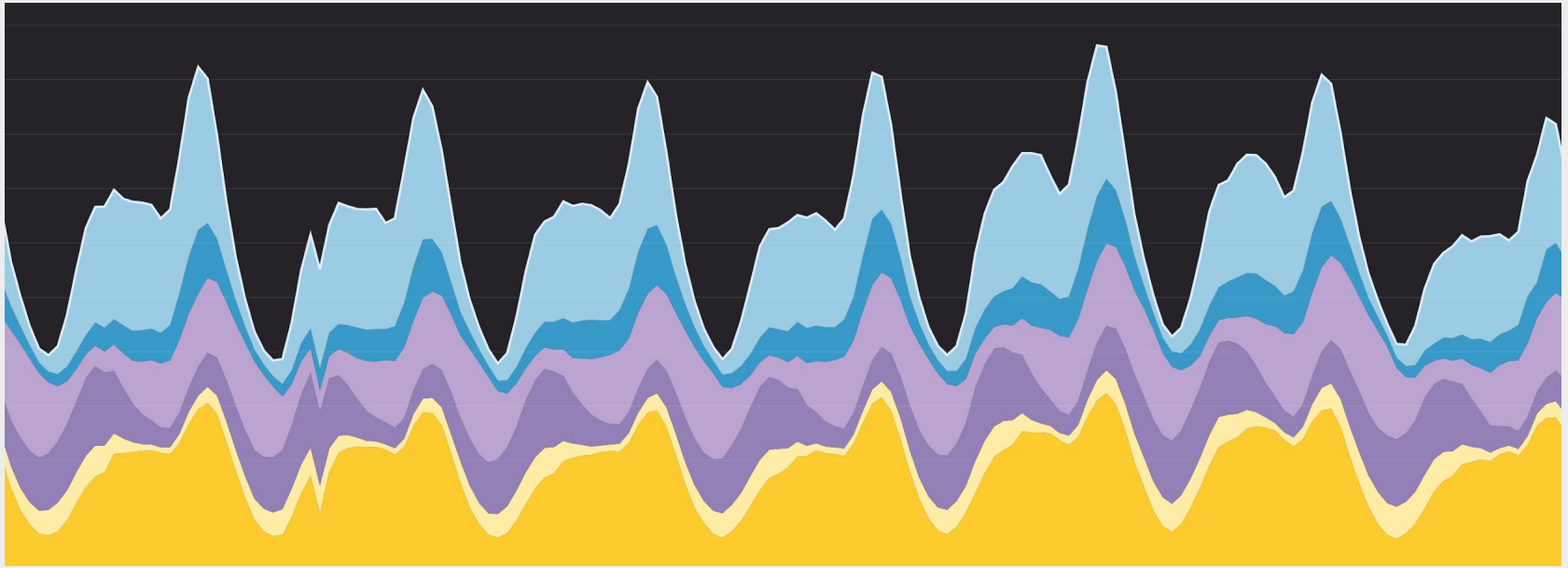


Final Fantasy XIV

August 20th: 3 hours

SUPER EVIL
MEGACORP

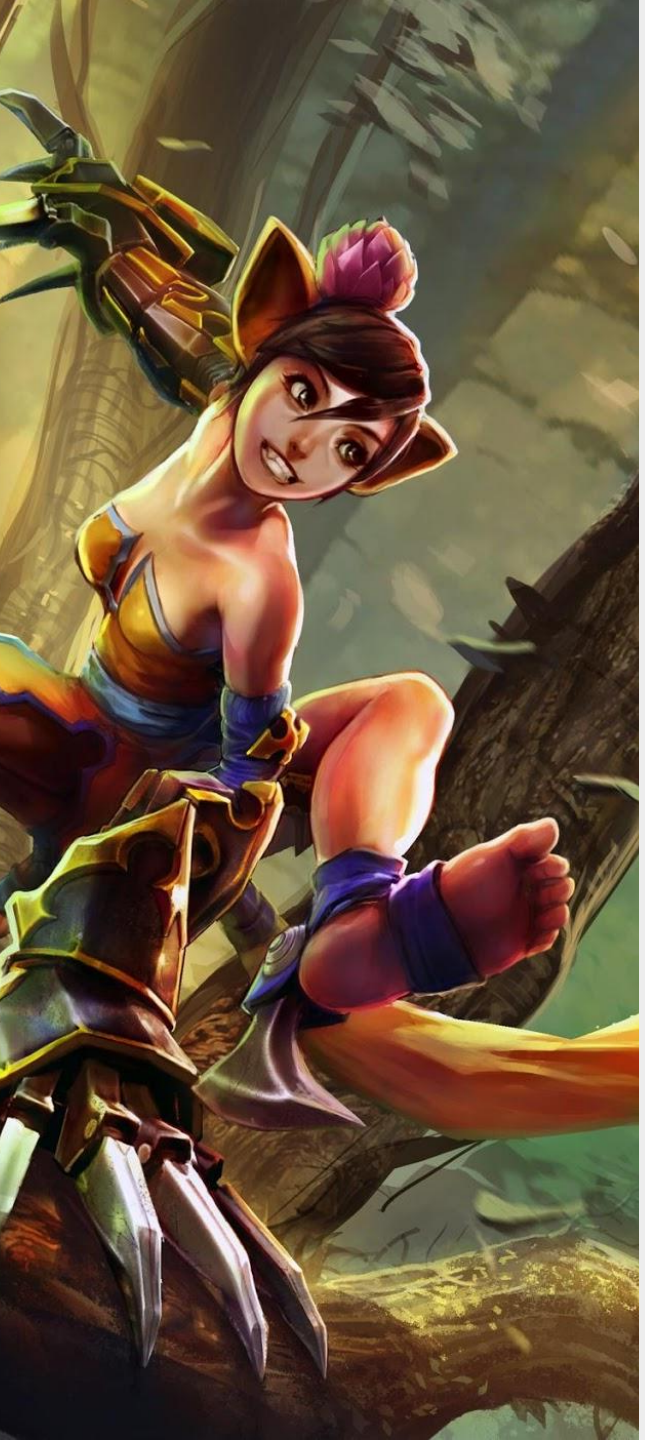
Vainglory Never Sleeps



5V5 and 3V3 matches

From 5 minutes up to 1 hour

Matchmaker is primary method for starting matches



Frictionless download-and-play experience for players

Wrest control of our servers from our past

Culture shift to industry standard tools and practices

Legacy Architecture

Acceptance

Auth | NA | SA | EU | EA | SEA | CN

Target Architecture

Pre-auth

Auth	Auth
Auth Data	

NA	NA
NA Data	

SA	SA
SA Data	

EU	EU
EU Data	

EA	EA
EA Data	

SEA	SEA
SEA Data	

CN	CN
CN Data	

Tools

Docker

python library: 3.3.0
Ubuntu: 17.03.1-ce
macOS: 18.03.1-ce

Packer

0.12.3

Ansible

2.4.4.0

supervisord

3.0b2-1

Jenkins

2.121.x

boto/boto3

boto: 2.49.0
boto3: 1.4.7

Terraform

0.10.7

jq

1.5

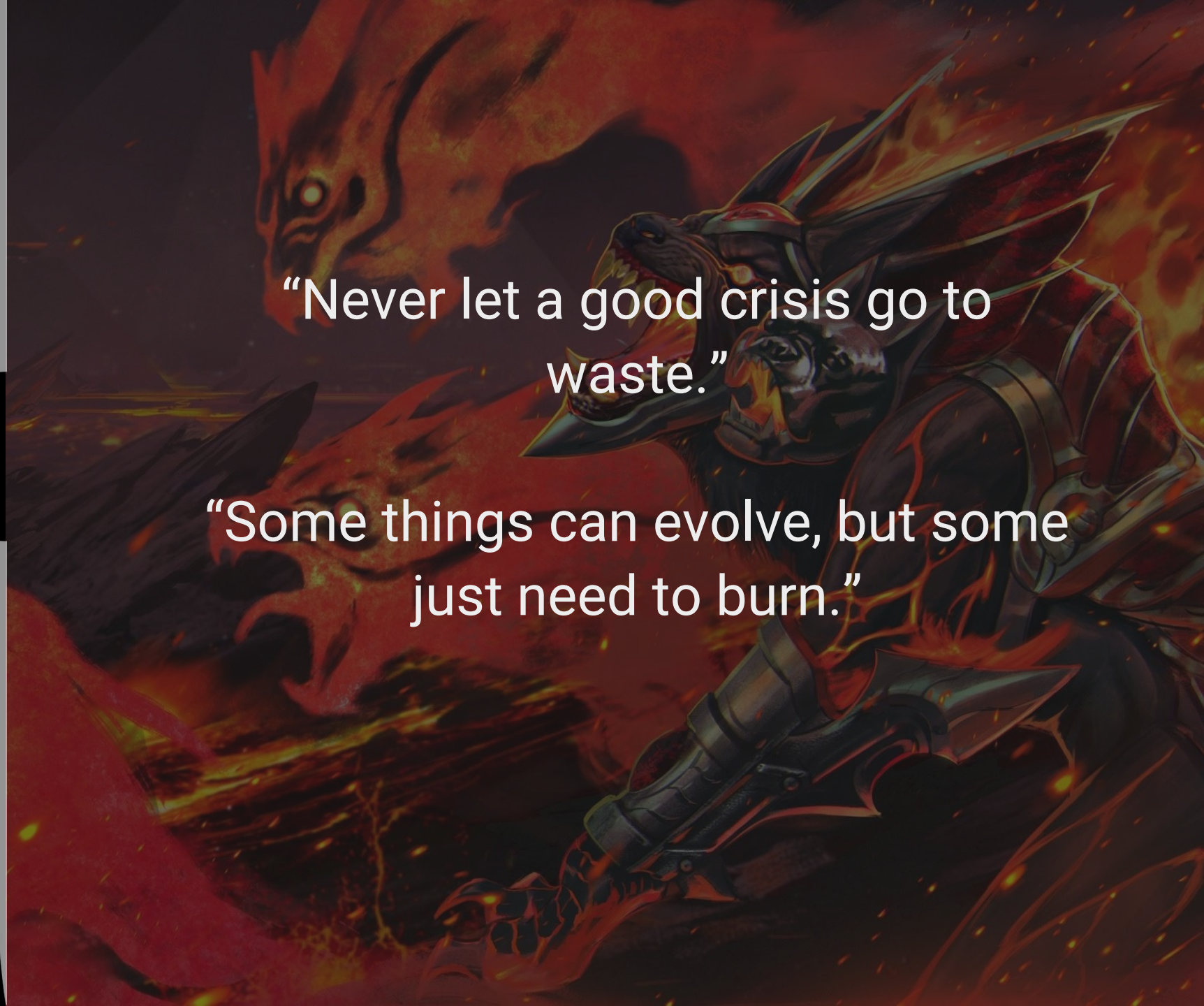
Python

2.7.10

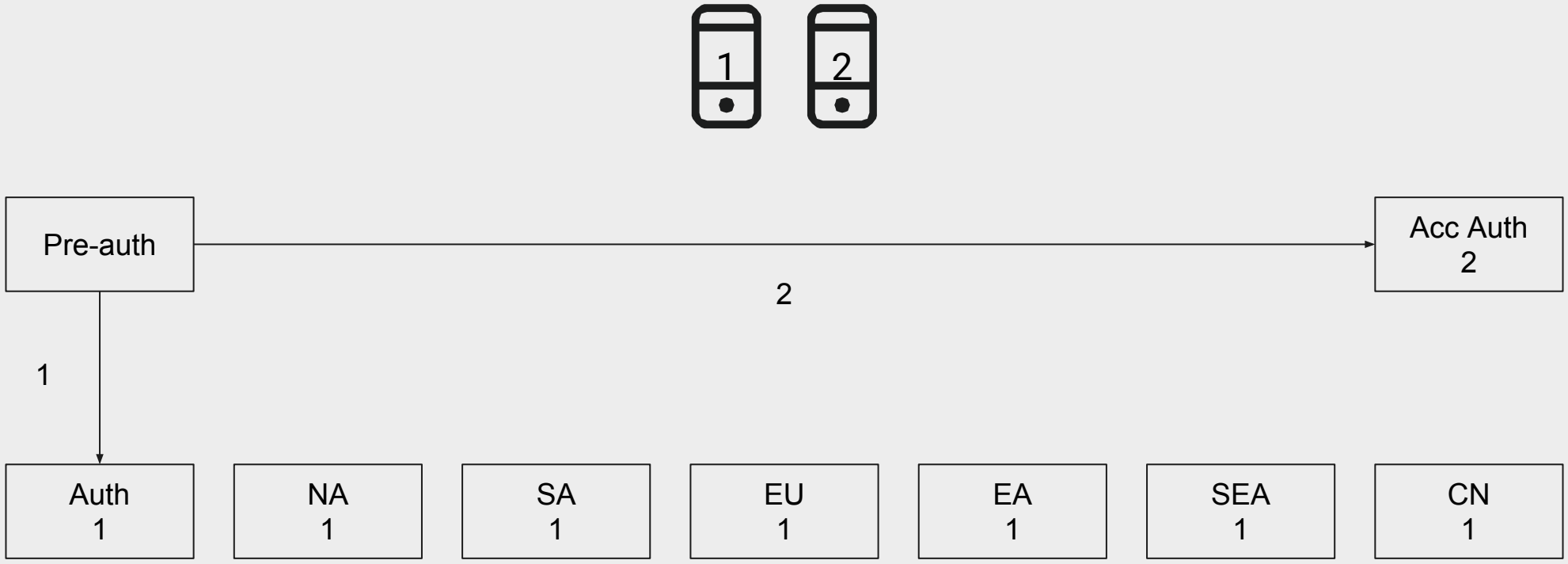
Ubuntu

AMI: 14.04 LTS 20180308
Container: 14.04 LTS via Docker library

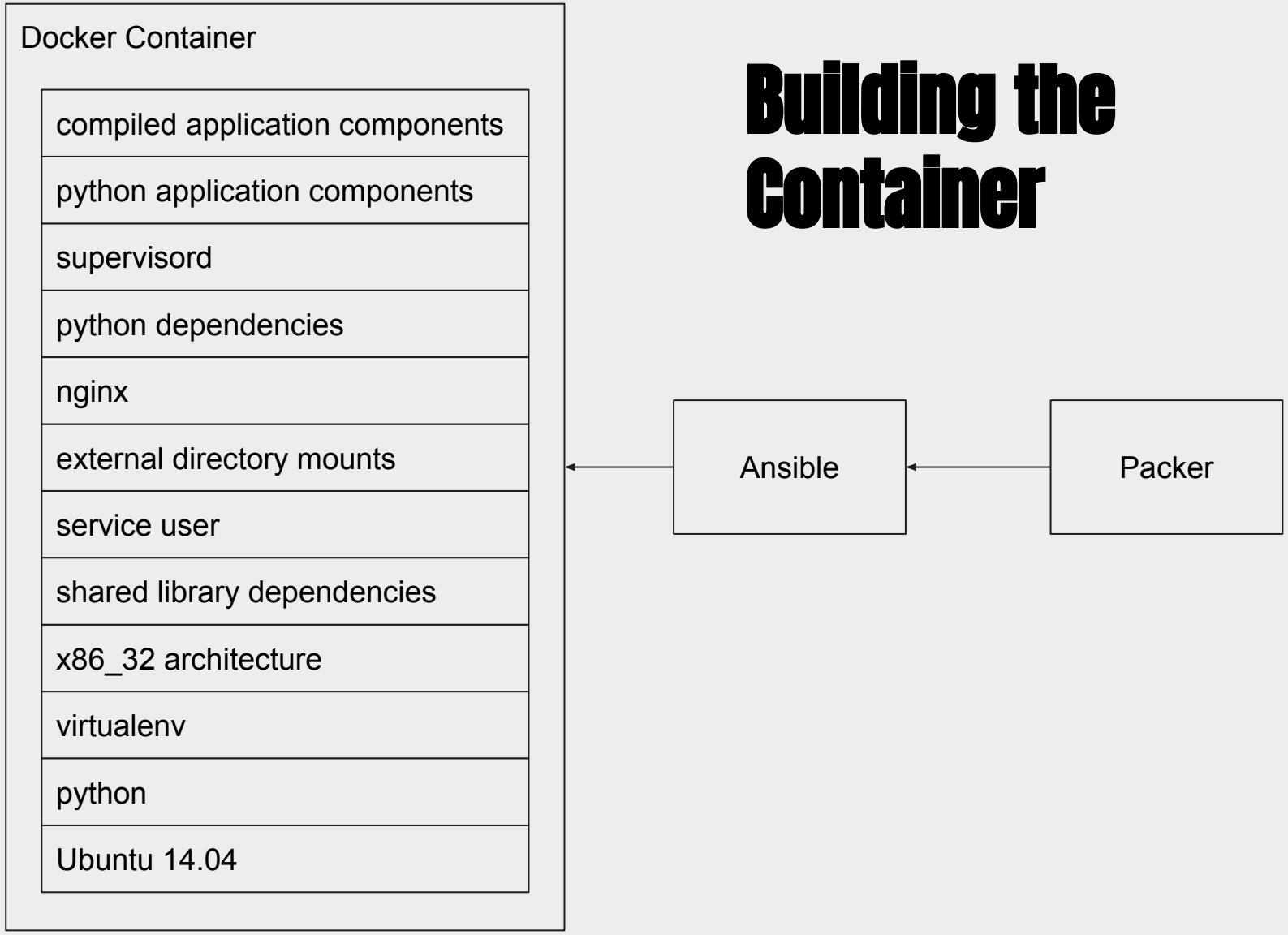
Acceptance


“Never let a good crisis go to waste.”
“Some things can evolve, but some just need to burn.”

Legacy Architecture with Pre-auth



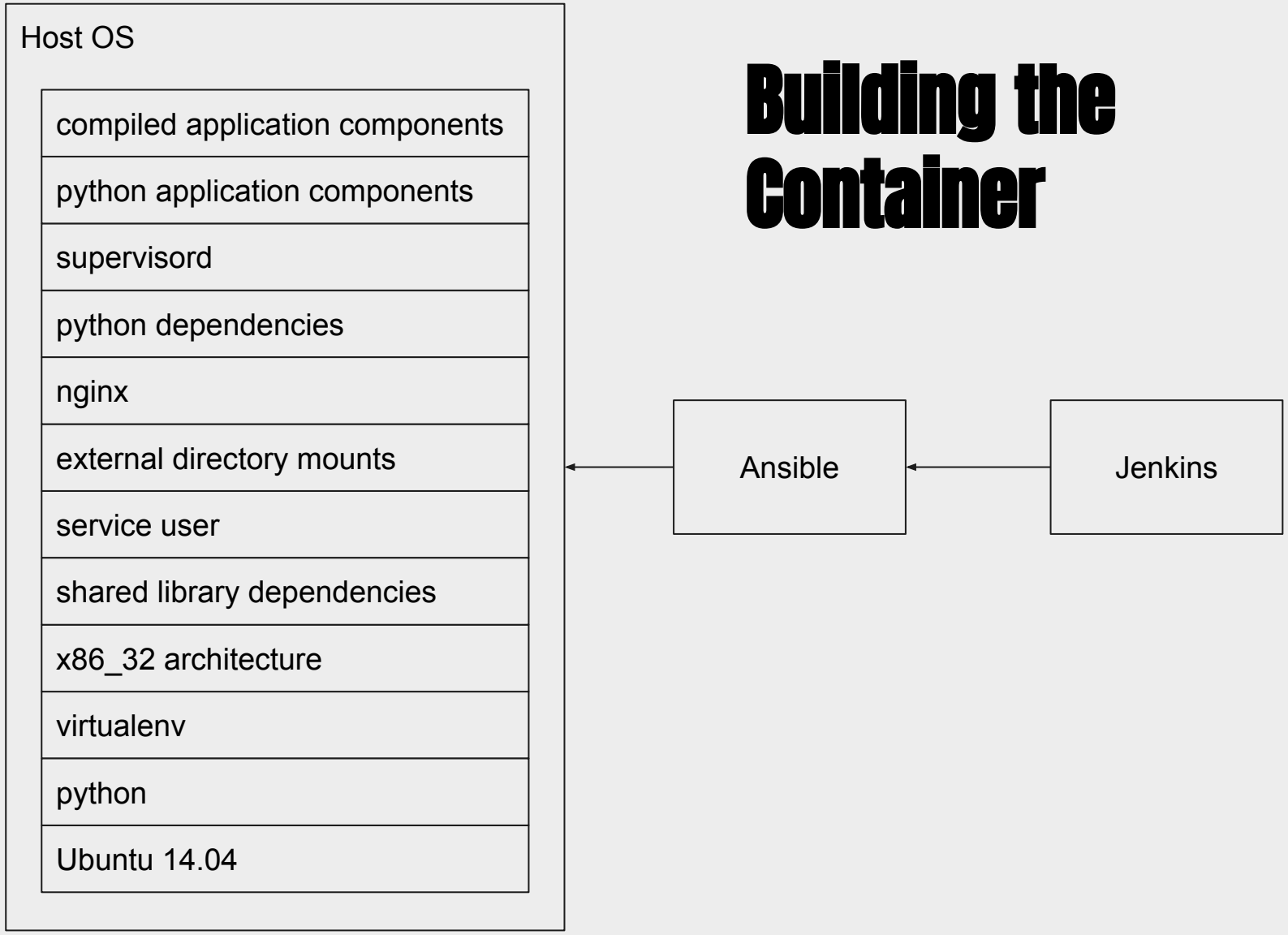
Building the Container



Packer defines the layers

Ansible makes the changes to the container

Building the Container



Packer defines the layers

Ansible makes the changes to the container

Or run directly against a waiting host

Runtime Process Structure

Host OS: Ubuntu 14.04: root process: init

Container OS: Ubuntu 14.04: root process: supervisord

Uperator: creates configuration files for nginx and application

python application daemons

nginx

supervisord is the container root process

Uperator creates config files from templates

supervisord manages application daemons

Local Dev

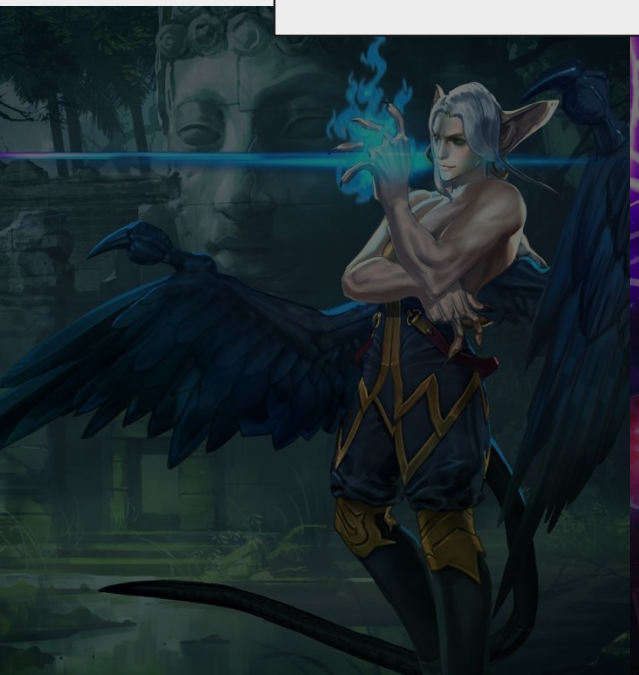
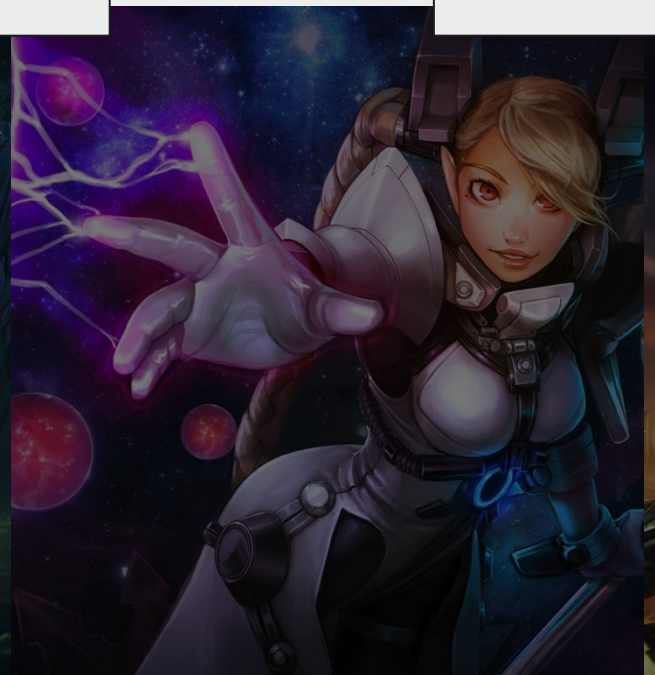
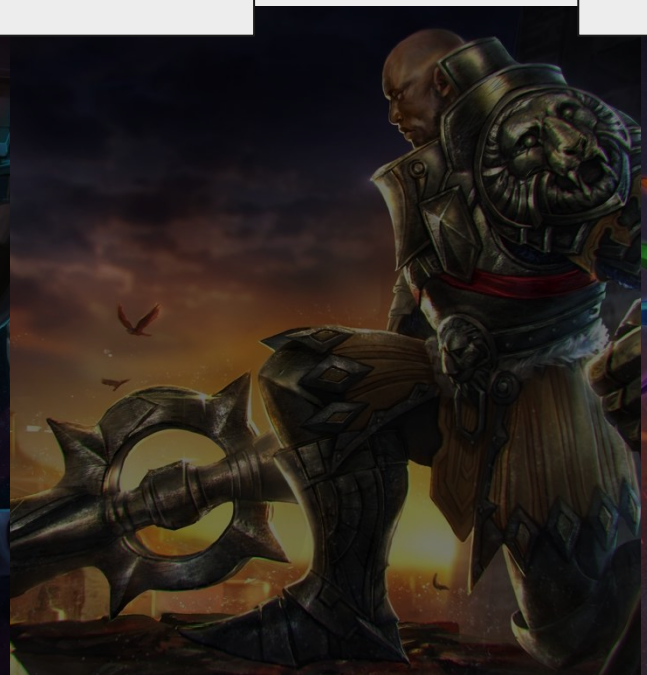
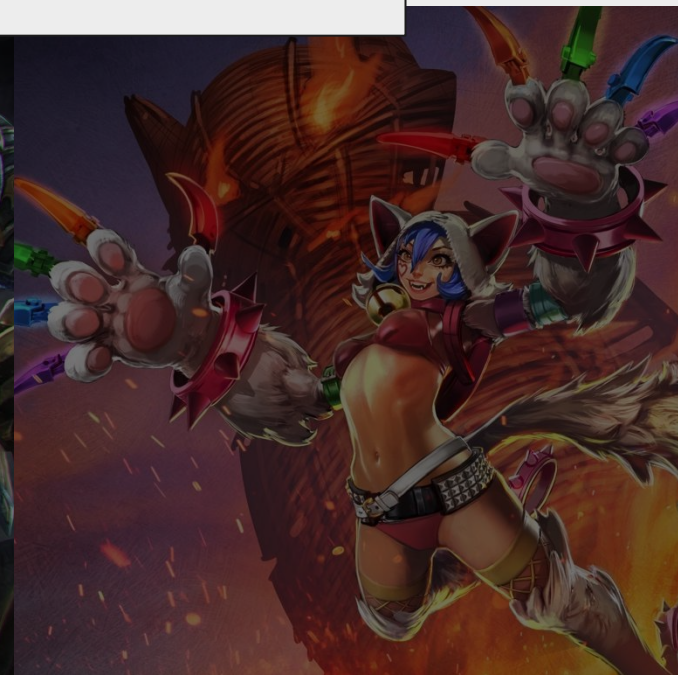
Local Client

Host Network

Application Container
Built per branch

Bridge Network

Data Container
Built per branch
Couchbase
ElasticSearch
RabbitMQ
[Redis]

HashiCorp

Terraform

Single Node

```
resource "aws_security_group"   "load_balancer"       { ... }
resource "aws_security_group"   "instance"            { ... }
resource "aws_alb"              "singlenode_lb"       { ... }
resource "aws_alb_target_group" "auth_lb"             { ... }
resource "aws_alb_listener"     "auth_lb"             { ... }
resource "aws_alb_target_group" "rpc_lb"              { ... }
resource "aws_alb_listener"     "rpc_lb"              { ... }
resource "aws_route53_record"   "dns"                 { ... }
resource "aws_instance"         "singlenode_instance" { ... }
```

Copy image to cloud storage

Copy image from cloud storage to container host

https://charity.wtf/

ANSIBLE

Deploying

Copy image to cloud storage

Copy image from cloud storage to container host

Restart with the new container

load image
remove from load balancer
stop old container
start new container
add to load balancer

ANSIBLE

Targeting

```
resource "aws_instance" "rpc_instance" {
...
  tags = {
    "Name" = "${var.env_name}-${var.game_region}-${var.env_part}-rpc"
    "Environment" = "${var.env_name}"
    "GameRegion" = "${var.game_region}"
    "EnvironmentPartition" = "${var.env_part}"
    "Role" = "rpc"
  }
...
}
```

Environment	stage
EnvironmentPartition	3-7
GameRegion	region
Name	stage-region-3-7-rpc
Role	rpc

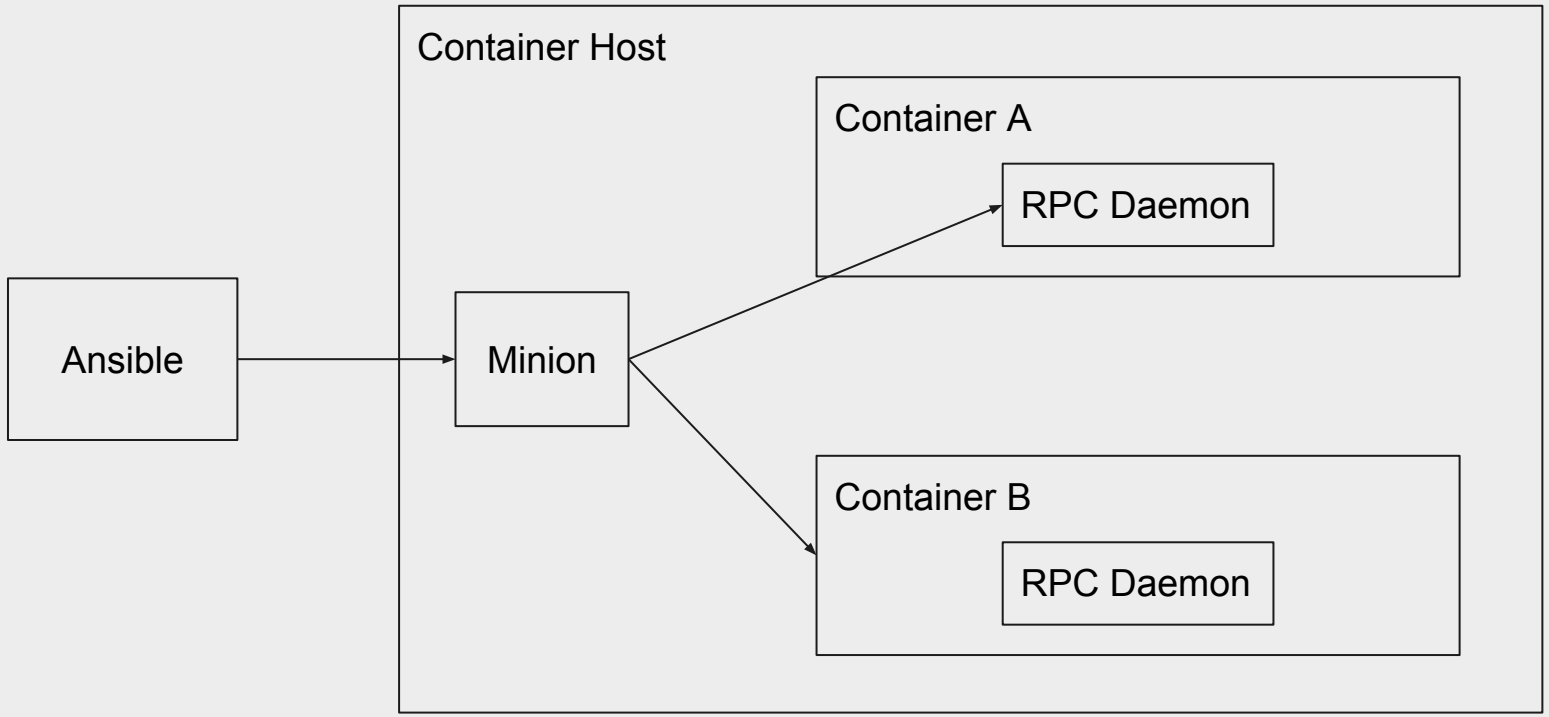
```
$ ansible all -m ping -i dynamic_inventory.py -l
"environment_stage:&environmentpartition_3-7:&gameregion_region:&role_rpc"
```

Define tags in Terraform

Generate inventory from cloud provider query

Use tags in limit expressions

Minion



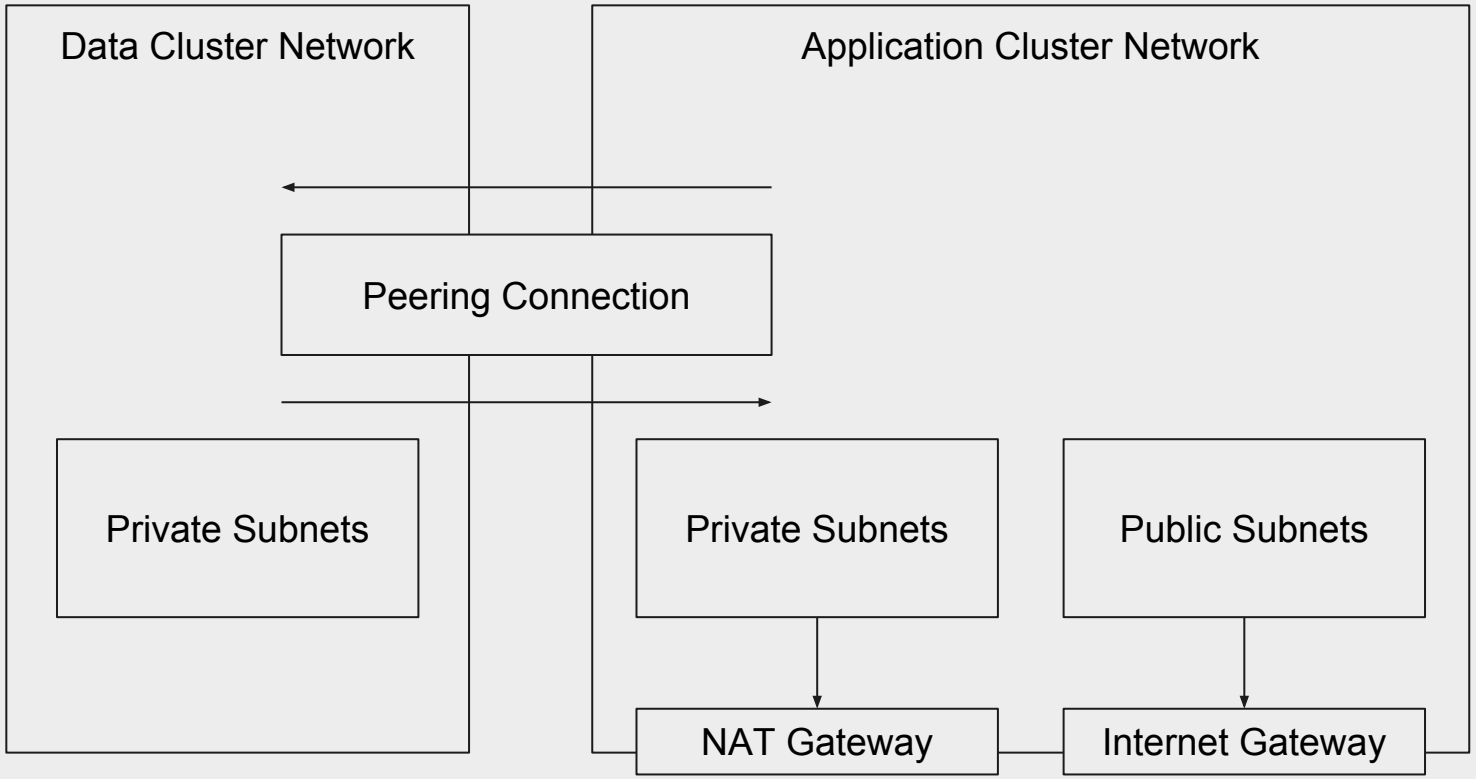
Container lifecycle operations

load
remove
save
start
stop

Application lifecycle operations

enter maintenance
exit maintenance
drain matches
reconfigure
start
stop
restart
status

Multi-node



Added networking

Keep the template simple

Iterate

Data Management

Have a plan for multiple application versions accessing the database

Databases with loose schemas provide flexibility that can help

Beware of cascading upgrades

NO SCRIPTS!

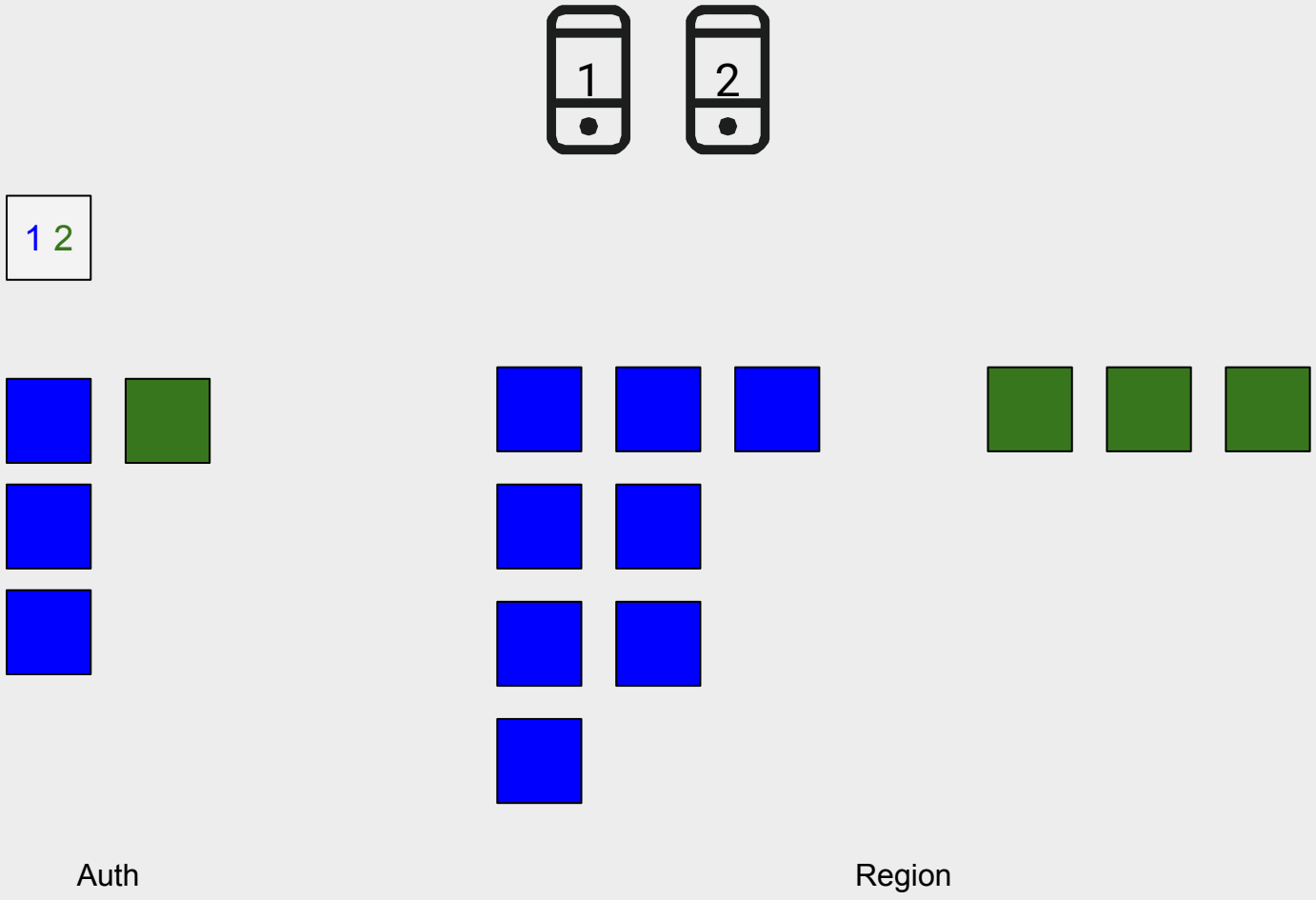
No Downgrades

No downgrades.

Player accounts are pinned to the highest release they have played

Simplifying a complex problem can be worth a quality of life cost

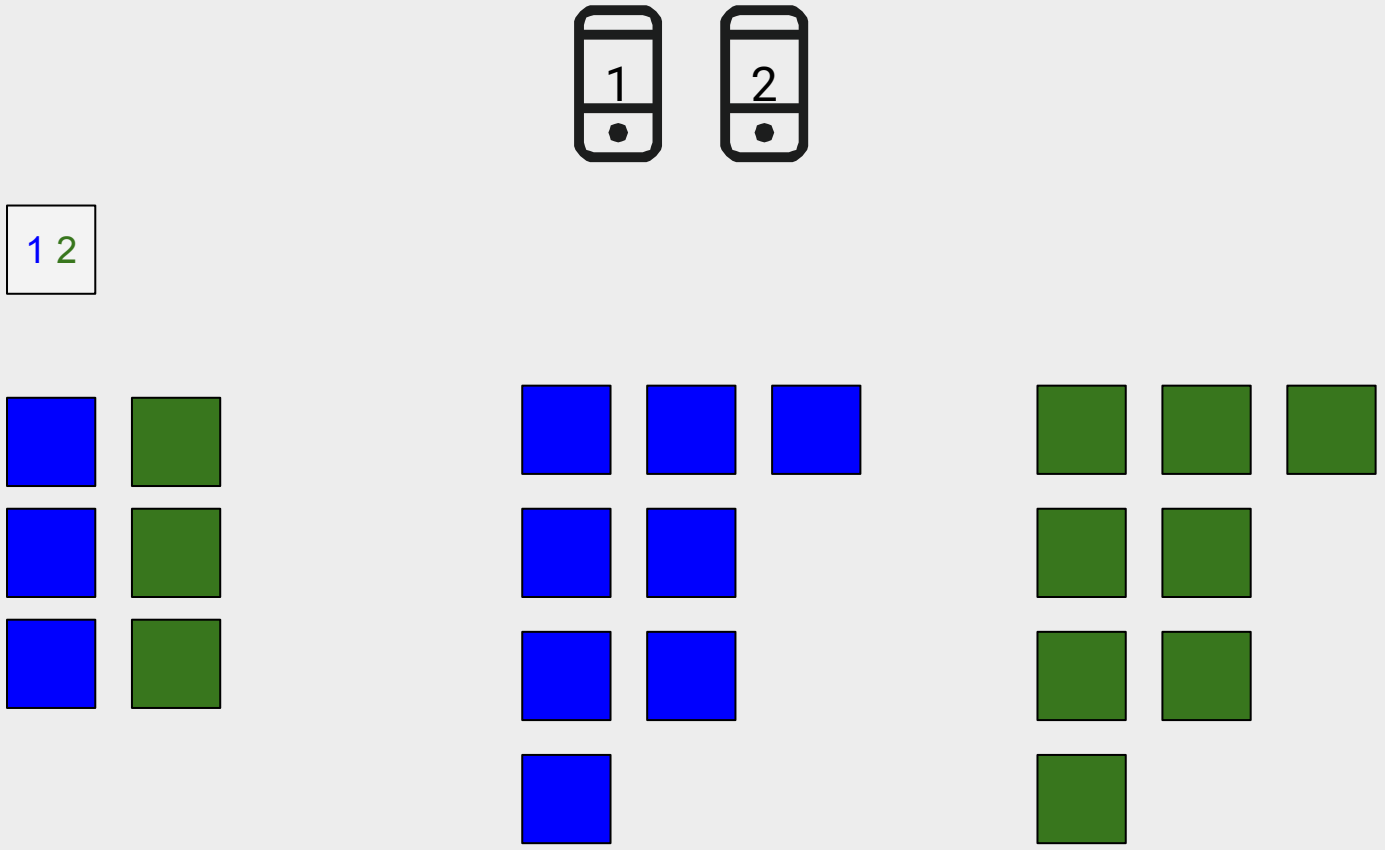
ME PRECIOUS
BUNKERS & BADASSES



Build minimal auth and regional application clusters

Add mapping to pre-auth

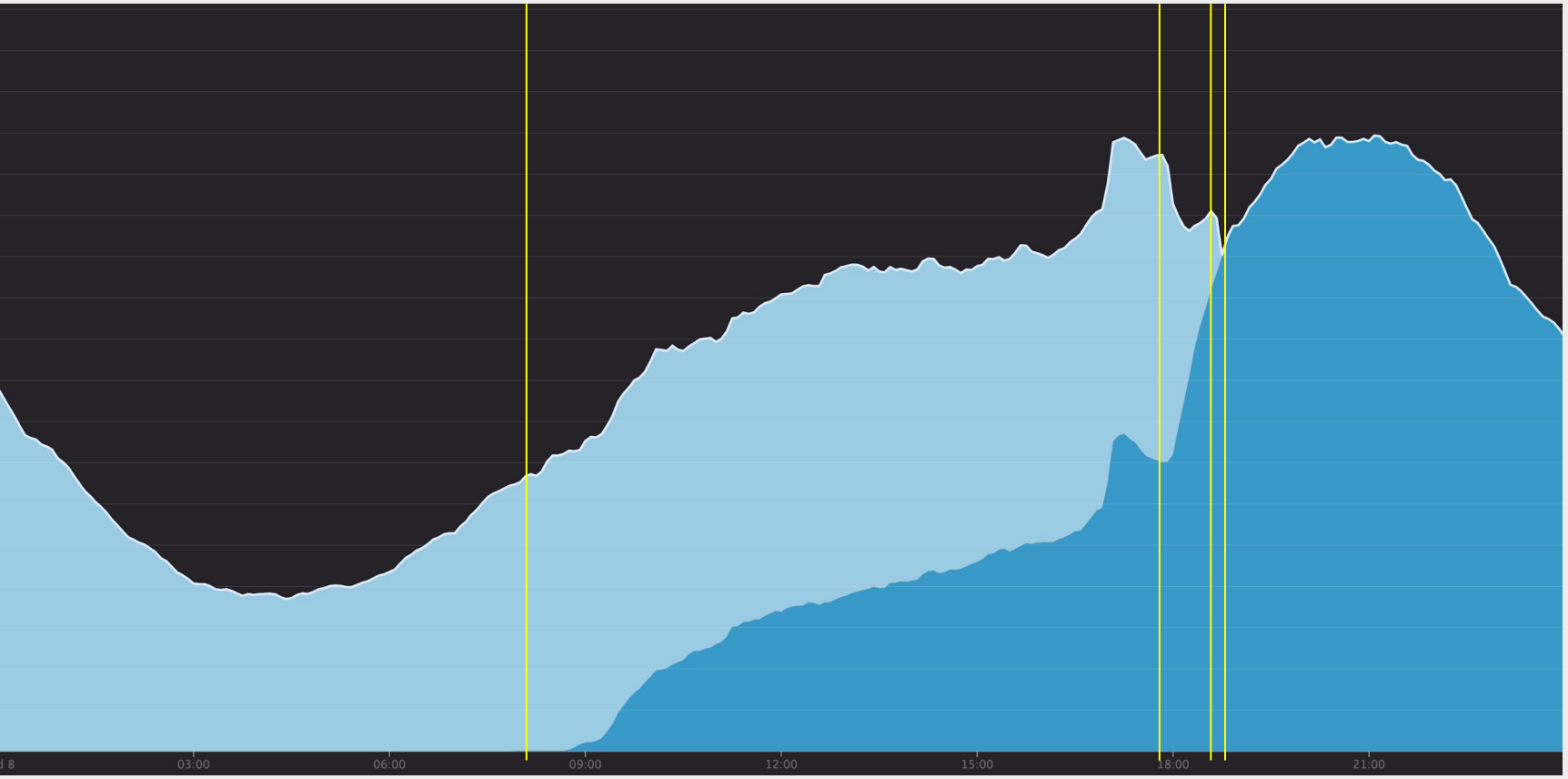
Test



Submit client for review

Lock content

Scale up



Release client in app stores

Stop new matches in old cluster

Force clients to upgrade on login

Tear down old cluster

Process Lessons

Not down, but not seamless

First attempt

Short outage

Second attempt

Forced upgrade too soon

Third attempt

Forced upgrade too late

ANSIBLE

Ansible Lessons

SSH can be painful

Use Paramiko

Use VPN instead of bastions

Jenkins Lessons

Geographically distributed agents

Restartable jobs

Parallel job execution

HashiCorp

Terraform

Terraform Lessons

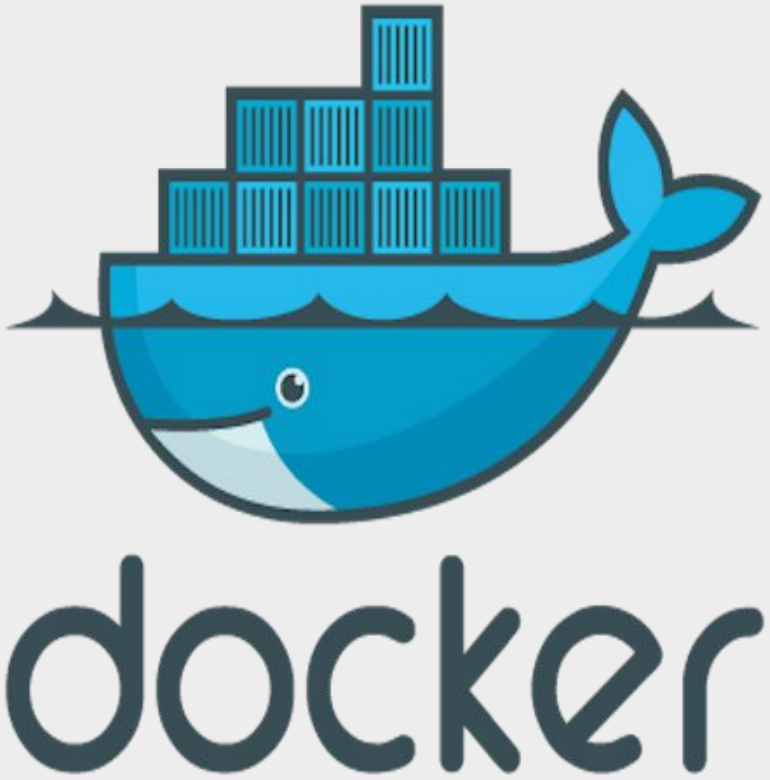
```
resource "aws_instance" "instance" {
...
  provisioner "remote-exec" {
    script = "${path.module}/../scripts/wait_for_instance.sh"

    connection {
      type = "ssh"
      user = "${var.ssh_user}"
      private_key = "${file("${var.ssh_private_key_path}")}"
    }
  }

  provisioner "local-exec" {
    command = "ANSIBLE_HOST_KEY_CHECKING=False ansible-playbook provision-container-host.yml"
  }
...
}
```

DON’T DO THIS

Simple provisioning

Associate instances with load balancers

Don’t sweat the state



Docker Lessons

Host networking is better than bridge networking

Tools for access

Choose root process wisely

HashiCorp

Packer

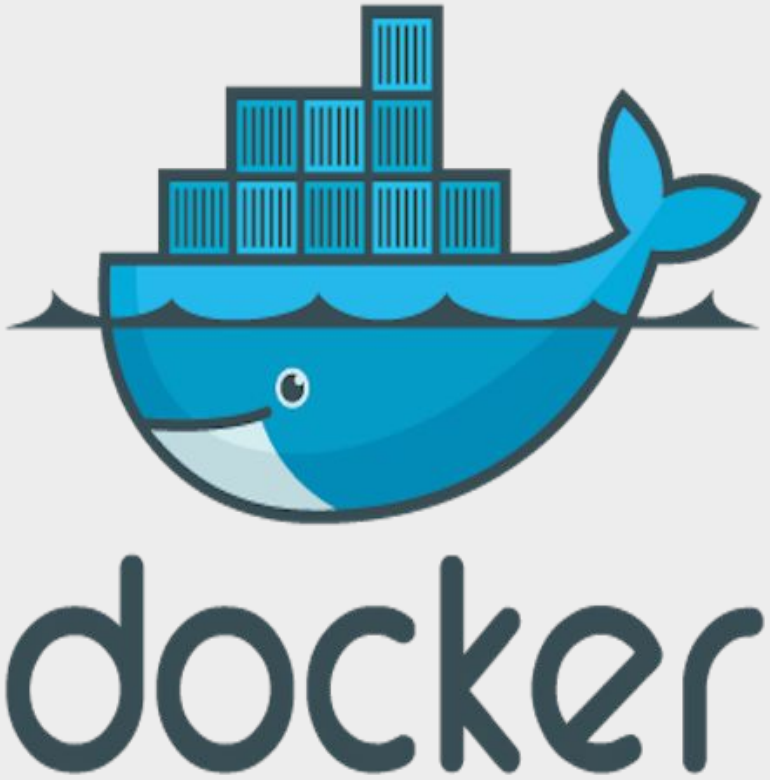
Packer Lessons

Consider your build servers, not just local dev builds.

Unique build container name

Prune orphan images often

Don’t build binaries inside your deployment container



Docker for Dev

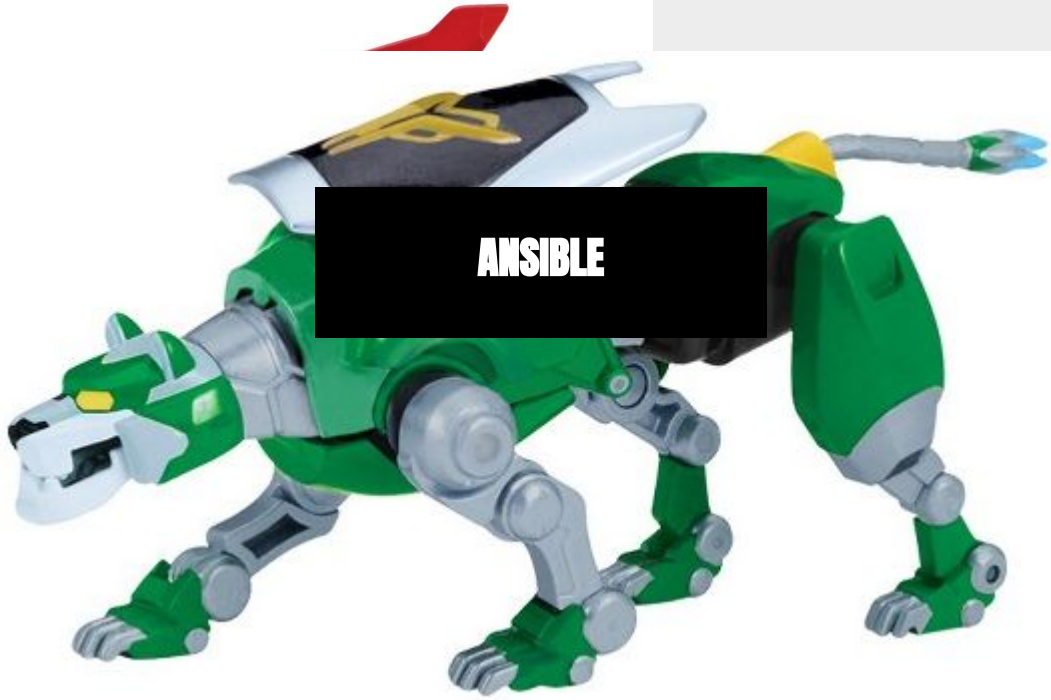
Good for server engineers. Maybe not for others.

Predictable environment

Slows iteration

Docker for Mac is unreliable

DOCKER


ANSIBLE

PRE-AUTH

TERRAFORM

Sean Austin

Lead Platform Engineer

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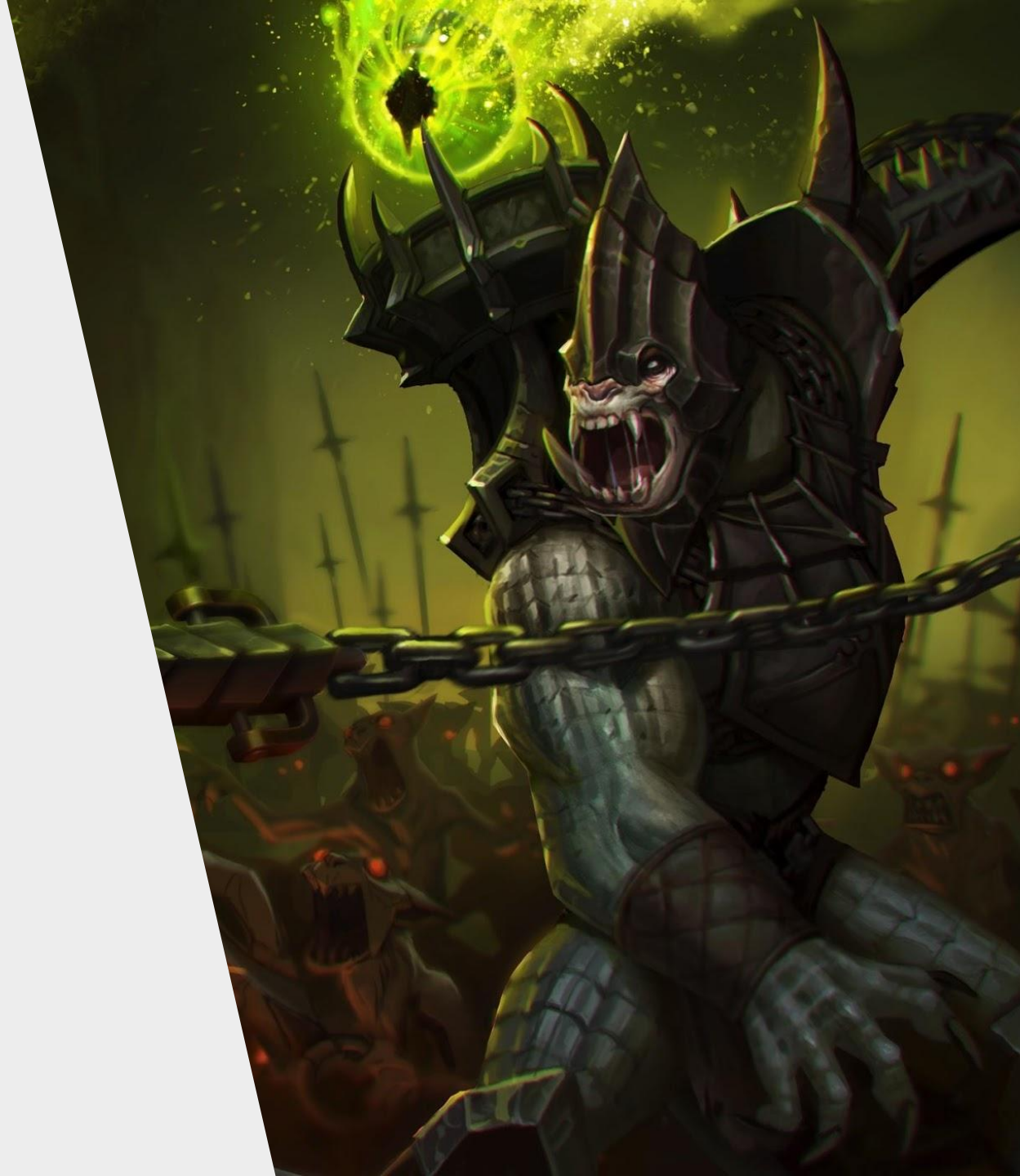
TAG: Loquori

LinkedIn: .../in/seanpaustin/

Tools Inventory

https://goo.gl/forms/yptOxB9T3UctK5LX2

Phinn



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VAIN
GLORY
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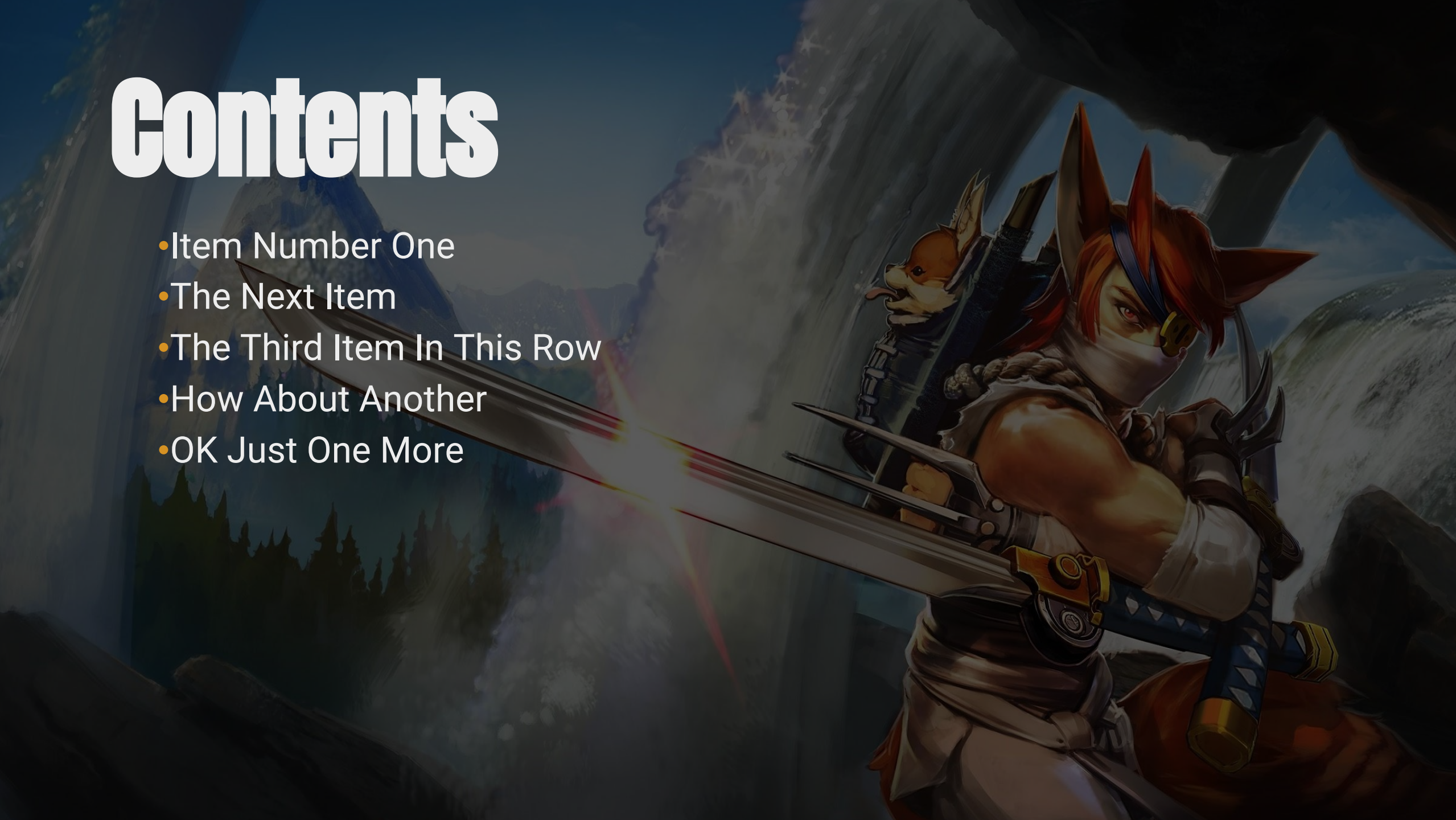
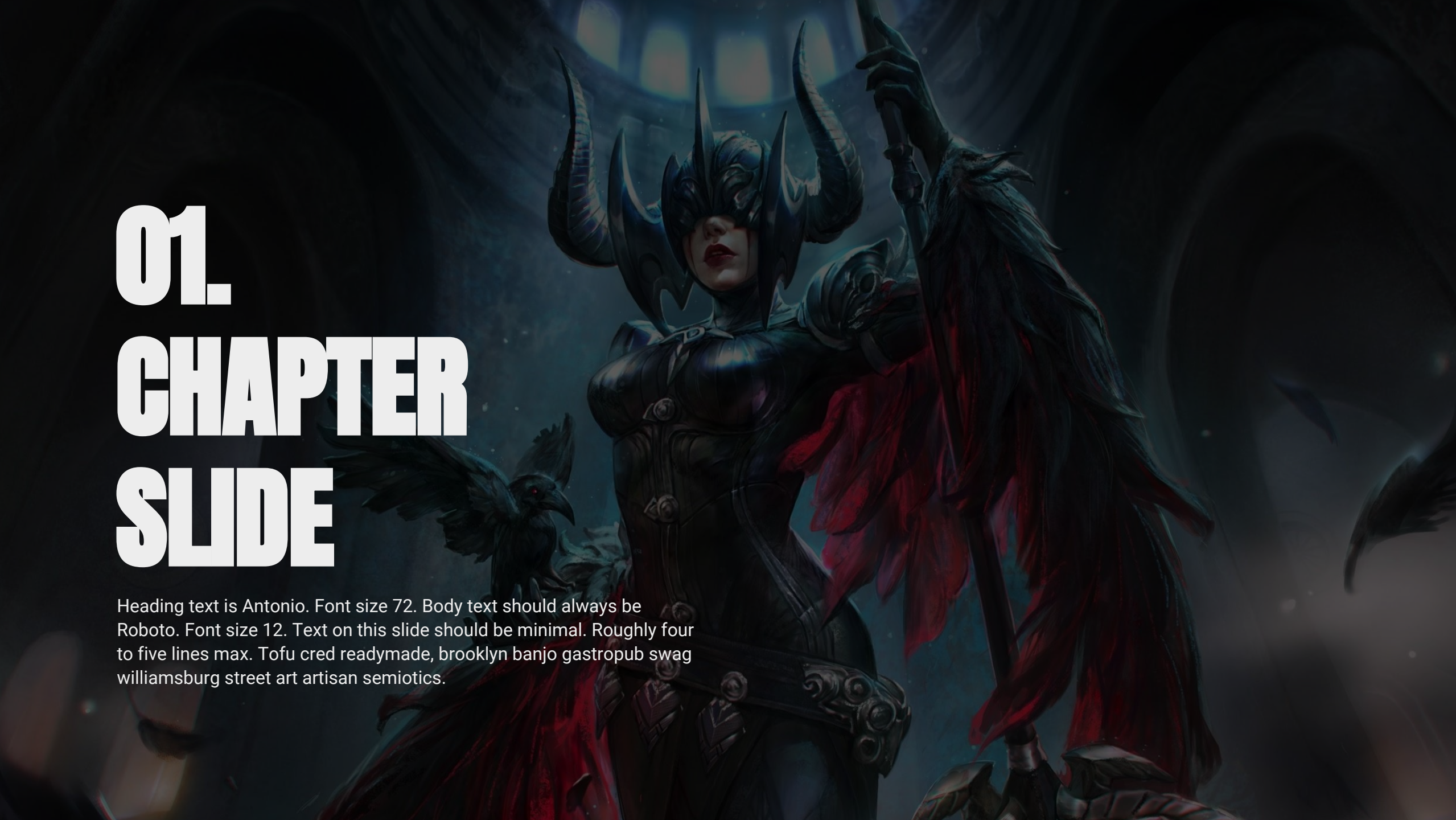
Contents

- Item Number One
- The Next Item
- The Third Item In This Row
- How About Another
- OK Just One More



Contents

1. Item 1
2. Item 2
3. Item 3
4. Item 4
5. Item 5
6. Item 6
7. Item 7
8. Item 8
9. Item 9
10. Item 10
11. Item 11
12. Item 12
13. Item 13
14. Item 14
15. Item 15
16. Item 16
17. Item 17
18. Item 18
19. Item 19
20. Item 20



01. CHAPTER SLIDE

Heading text is Antonio. Font size 72. Body text should always be Roboto. Font size 12. Text on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics.

WELCOME TO THE VAINGLORY PRESENTATION

Slide master sub-head Roboto 14

Body text is Roboto size 12. Text on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow gingerbread icing jelly sesame snaps. Claw. Pie jujubes pie ice cream ice brand advertising.

WELCOME TO THE EVIL PRESENTATION

Slide master sub-head Roboto 14

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IMAGE ON TOP

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4 IMAGES AT THE BOTTOM

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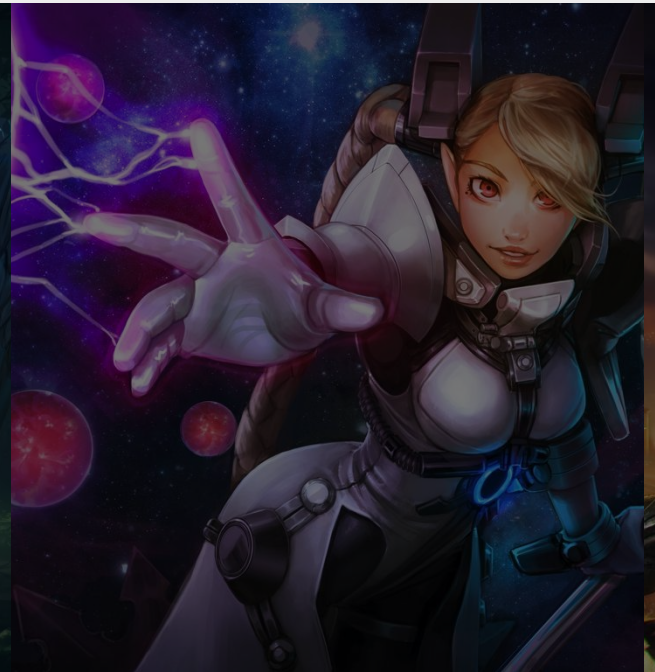
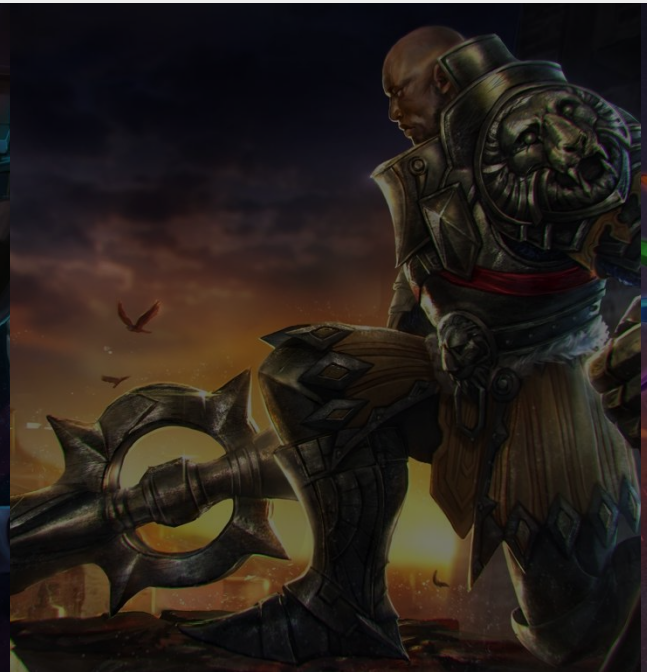
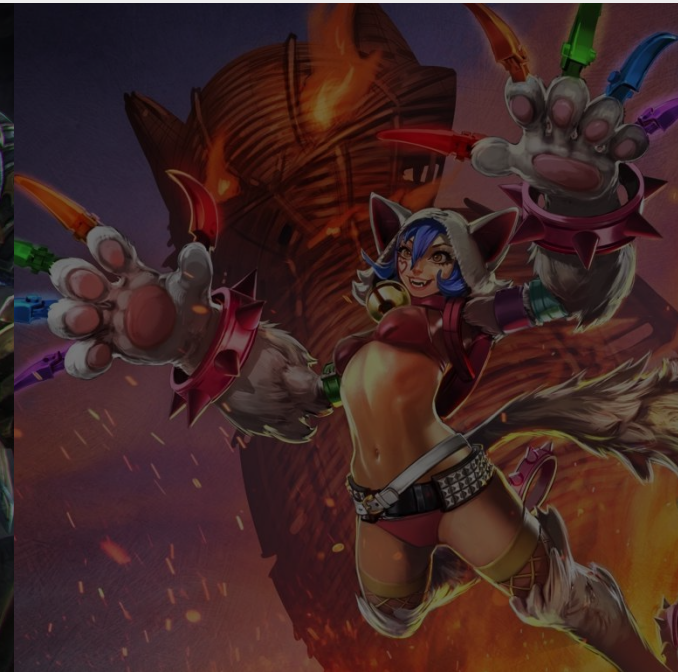

IMAGE ON THE RIGHT

Subhead Text Goes Here

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ANTONIO BOLD 20

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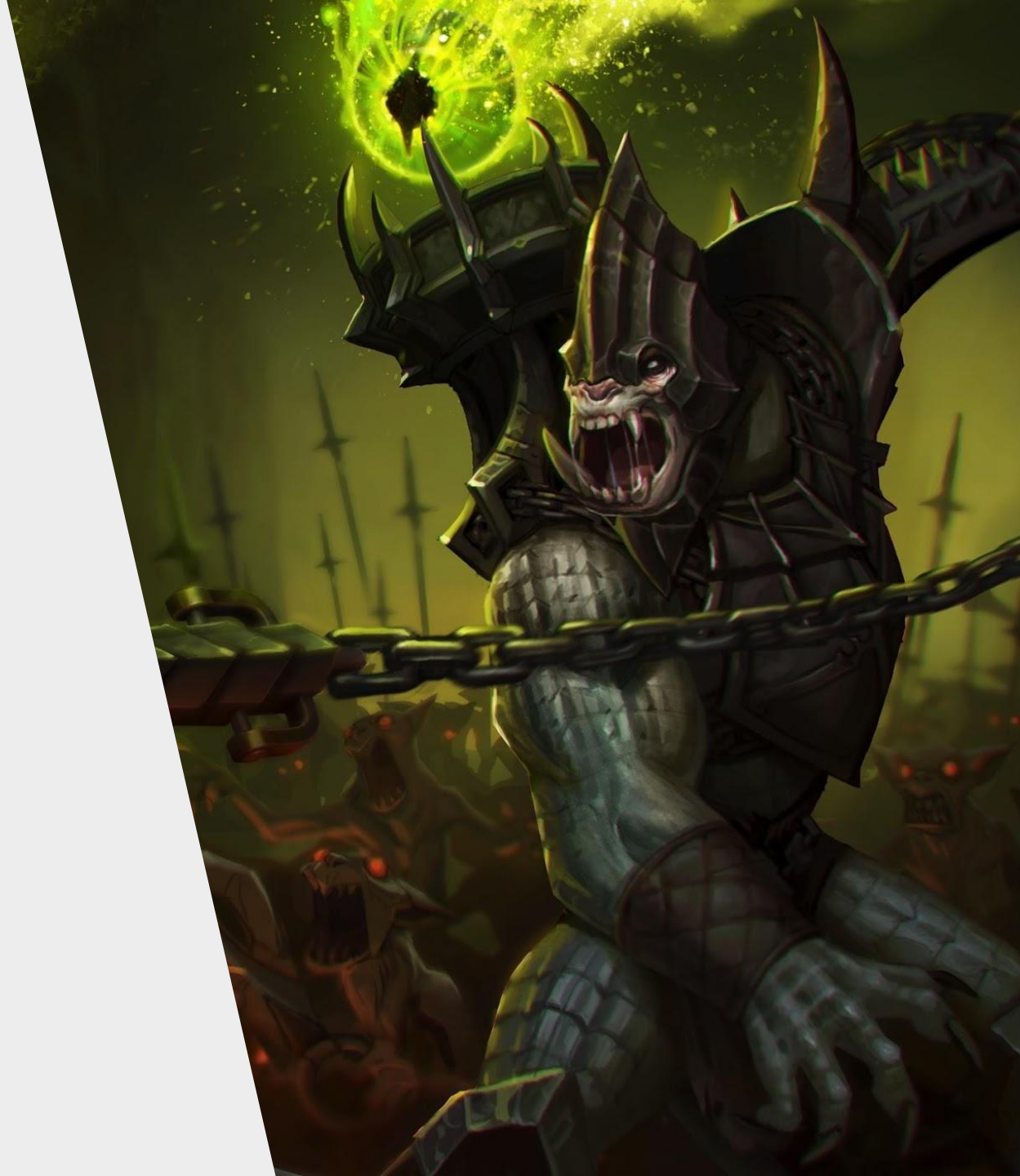
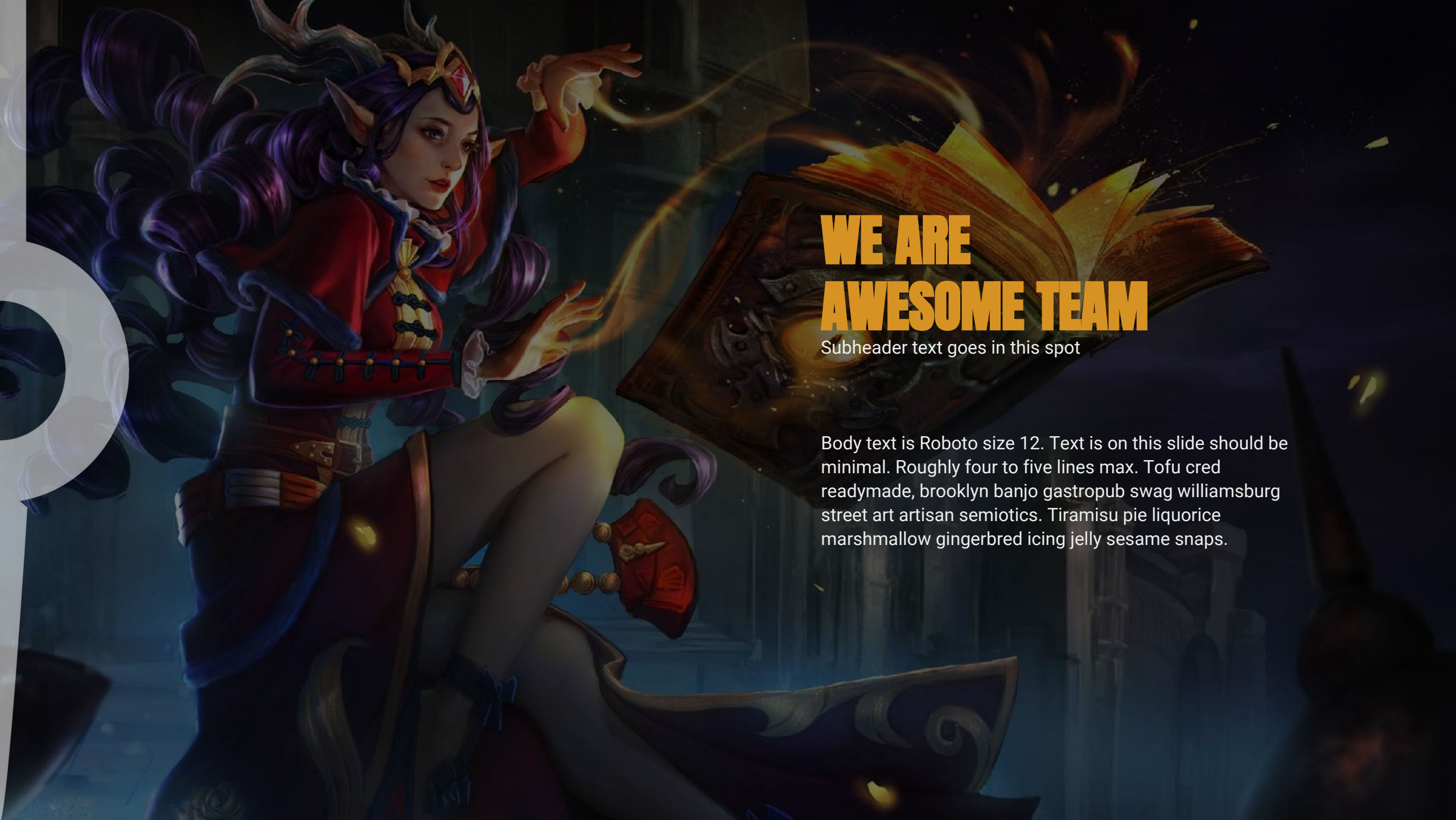
Branding

100%





WE ARE AWESOME TEAM

Subheader text goes in this spot

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THREE PICTURES

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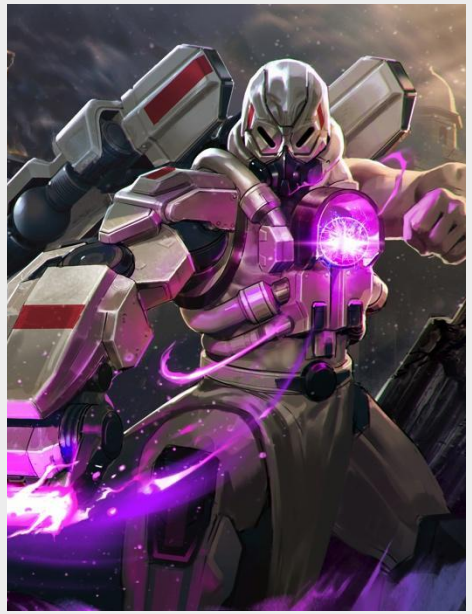
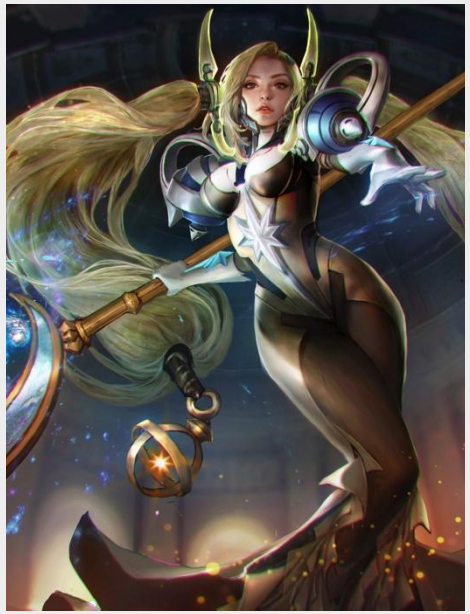


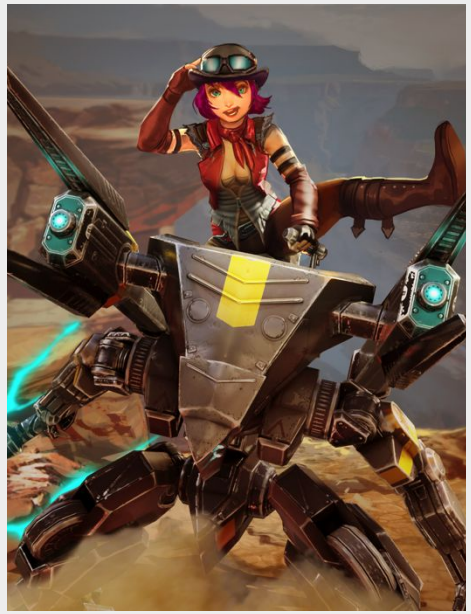
CHARACTER 1

Super Evil Content Description



CHARACTER 2

Super Evil Content Description



CHARACTER 3

Super Evil Content Description

IMAGE ON THE RIGHT

Subheader text goes heres

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SECTION HEADER

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SLIDE MASTER HEADER ANTONIO 66

VAIN GLORY

TITLE GOES HERE

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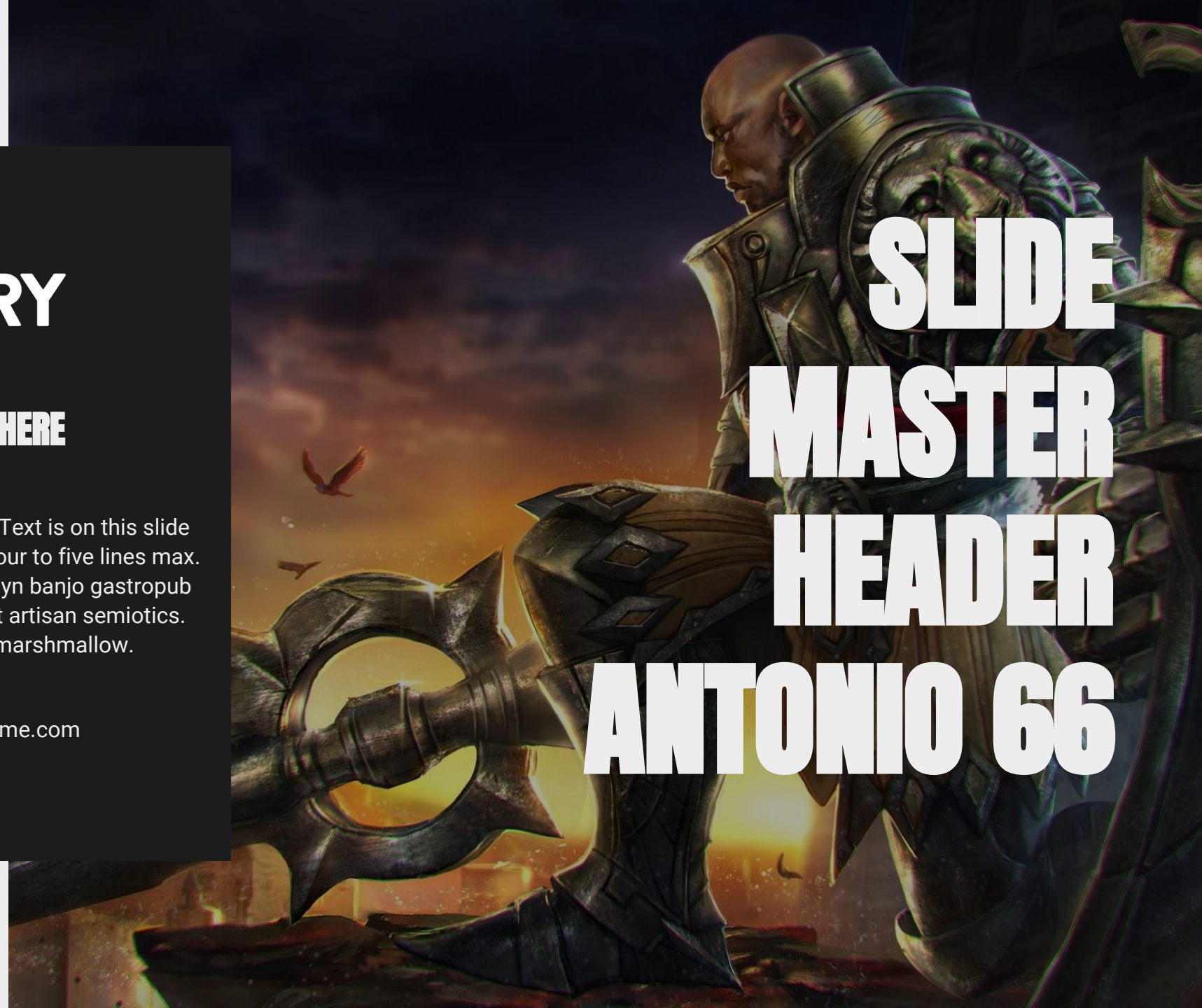

VAIN GLORY

TITLE GOES HERE

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www.vainglorygame.com

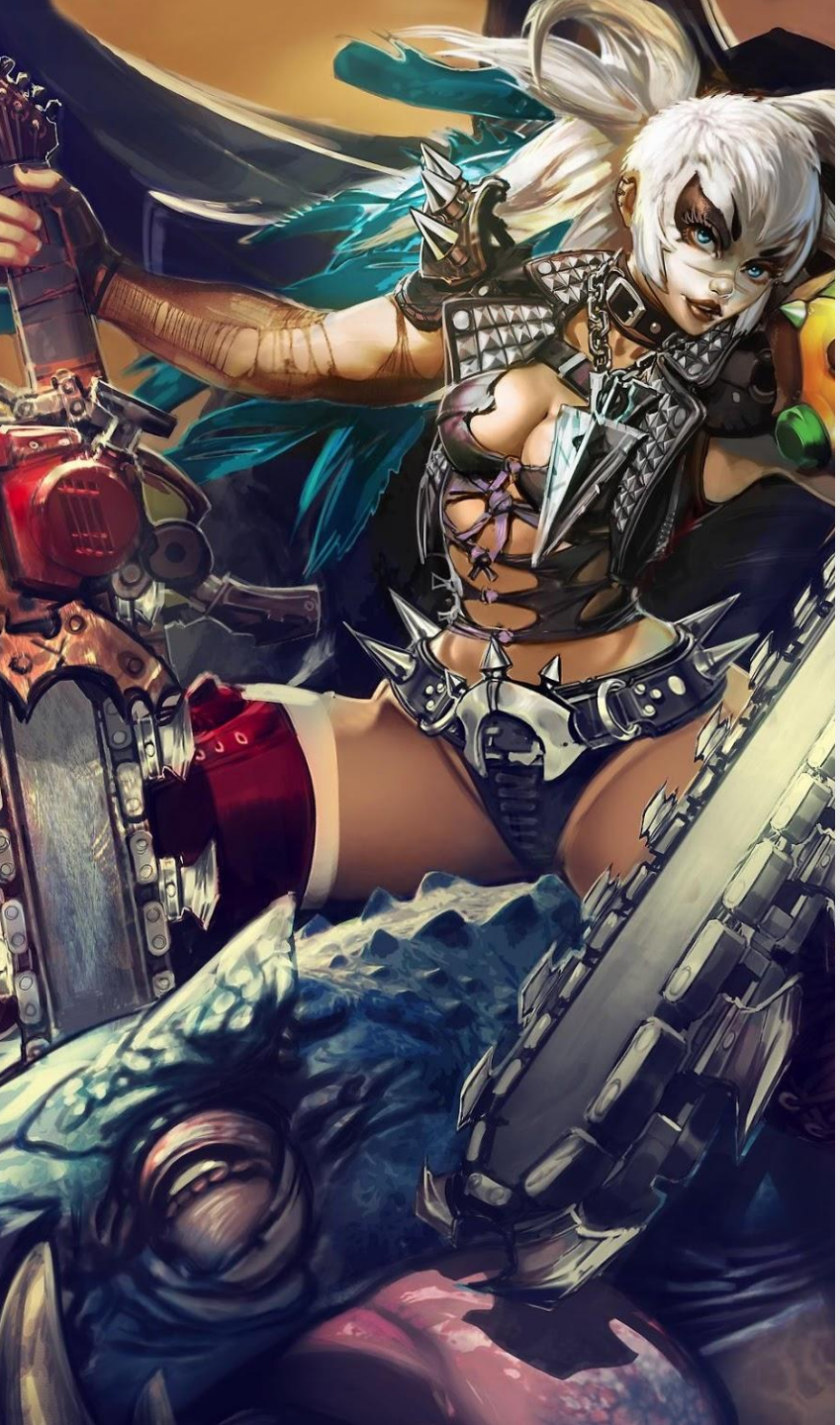

IMAGE ON THE LEFT

Subheader text goes here

Body text is Roboto size 12. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street.

SECTION HEADER

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SECTION HEADER

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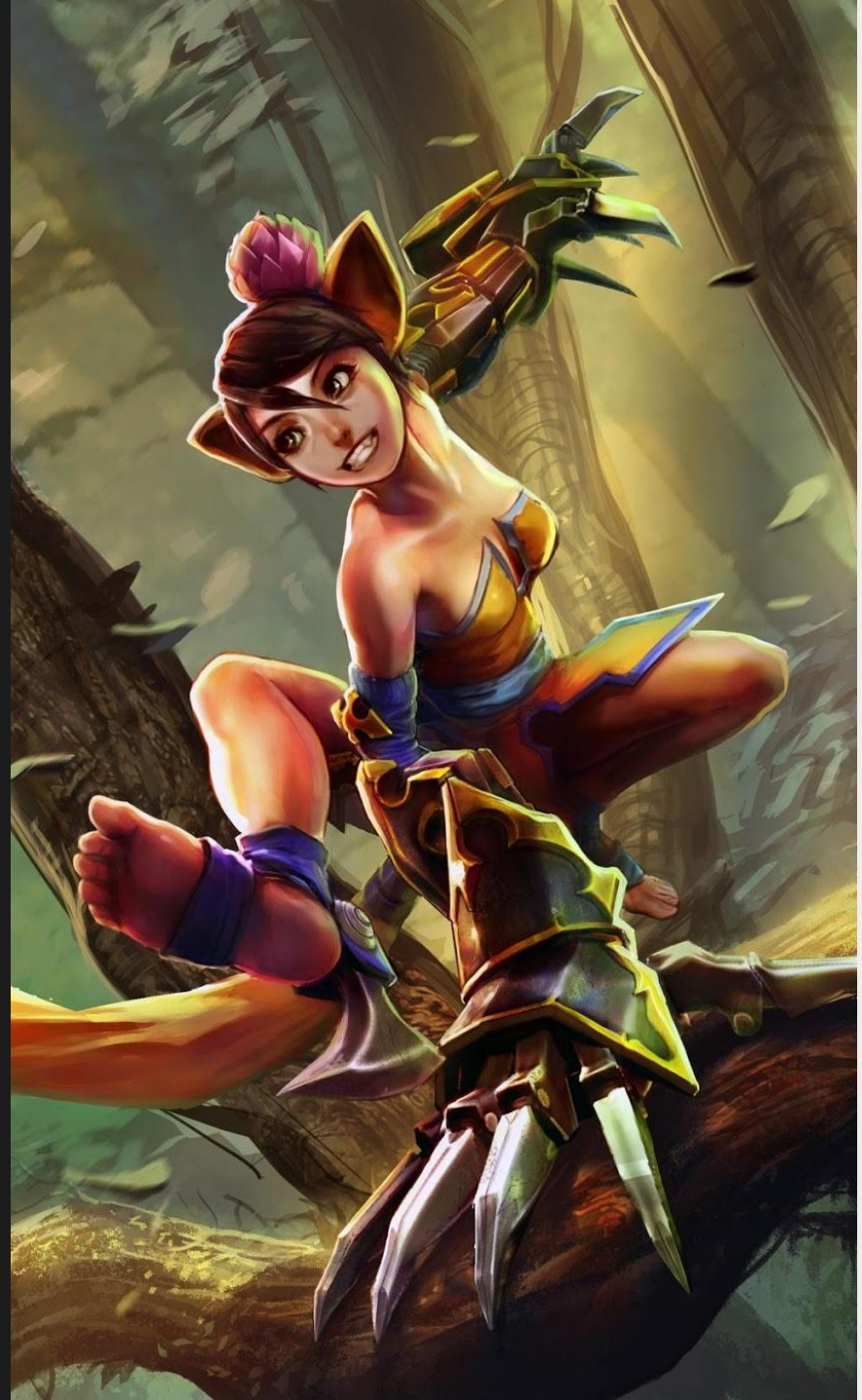
Branding

100%

Marketing Promotion

80%



ANTONIO BOLD 36

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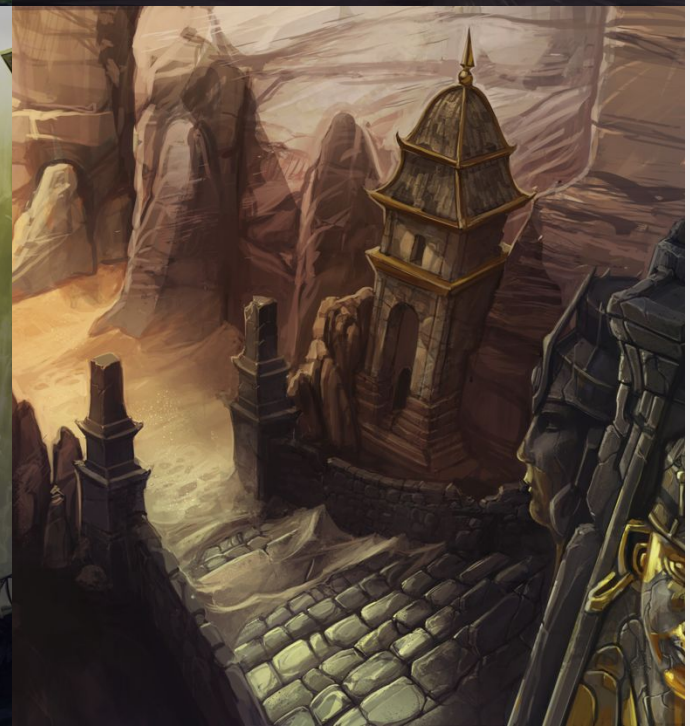

IMAGES AND FOUR TEXT

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SECTION HEADER

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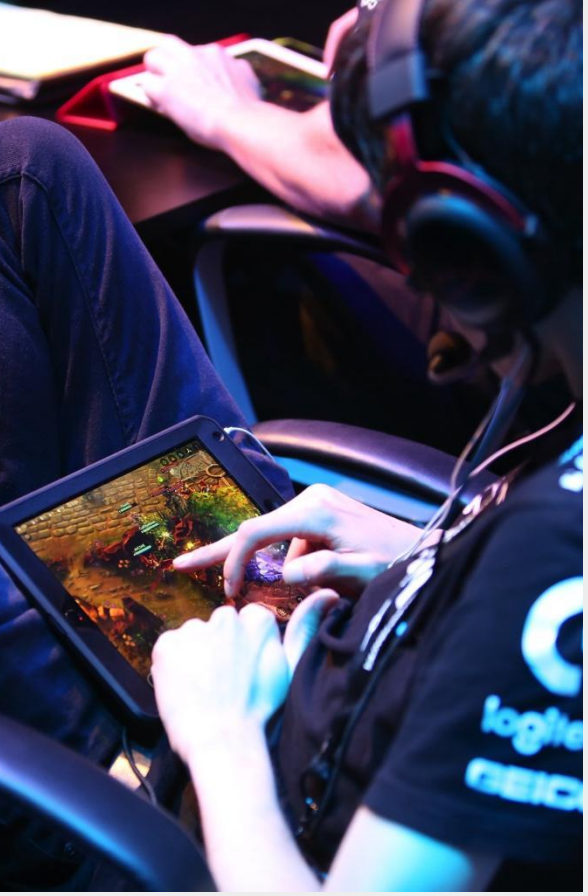

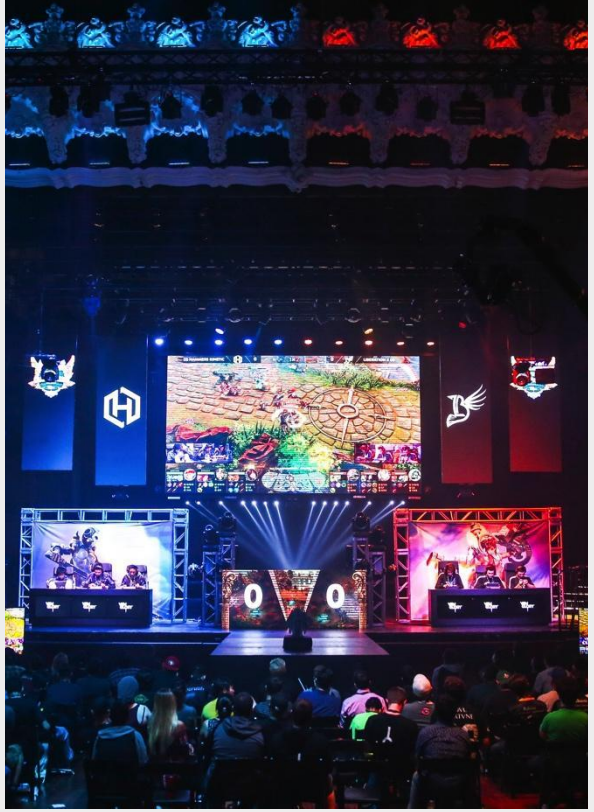

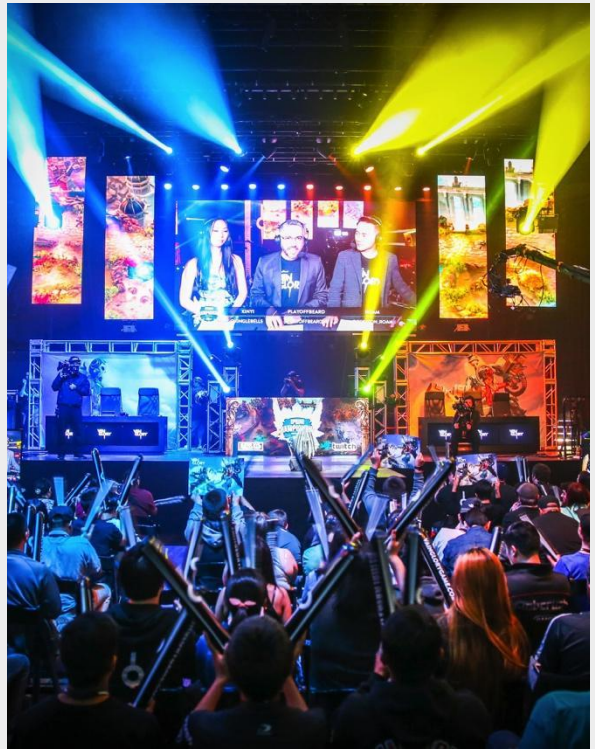

SIX IMAGES LAYOUT

Subhead text goes here

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Branding

100%

Marketing Promotion

80%

IMAGE ON THE RIGHT WITH PIN

Subhead text goes here

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SECTION HEADER

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IMAGE & CHART ON THE RIGHT

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Branding

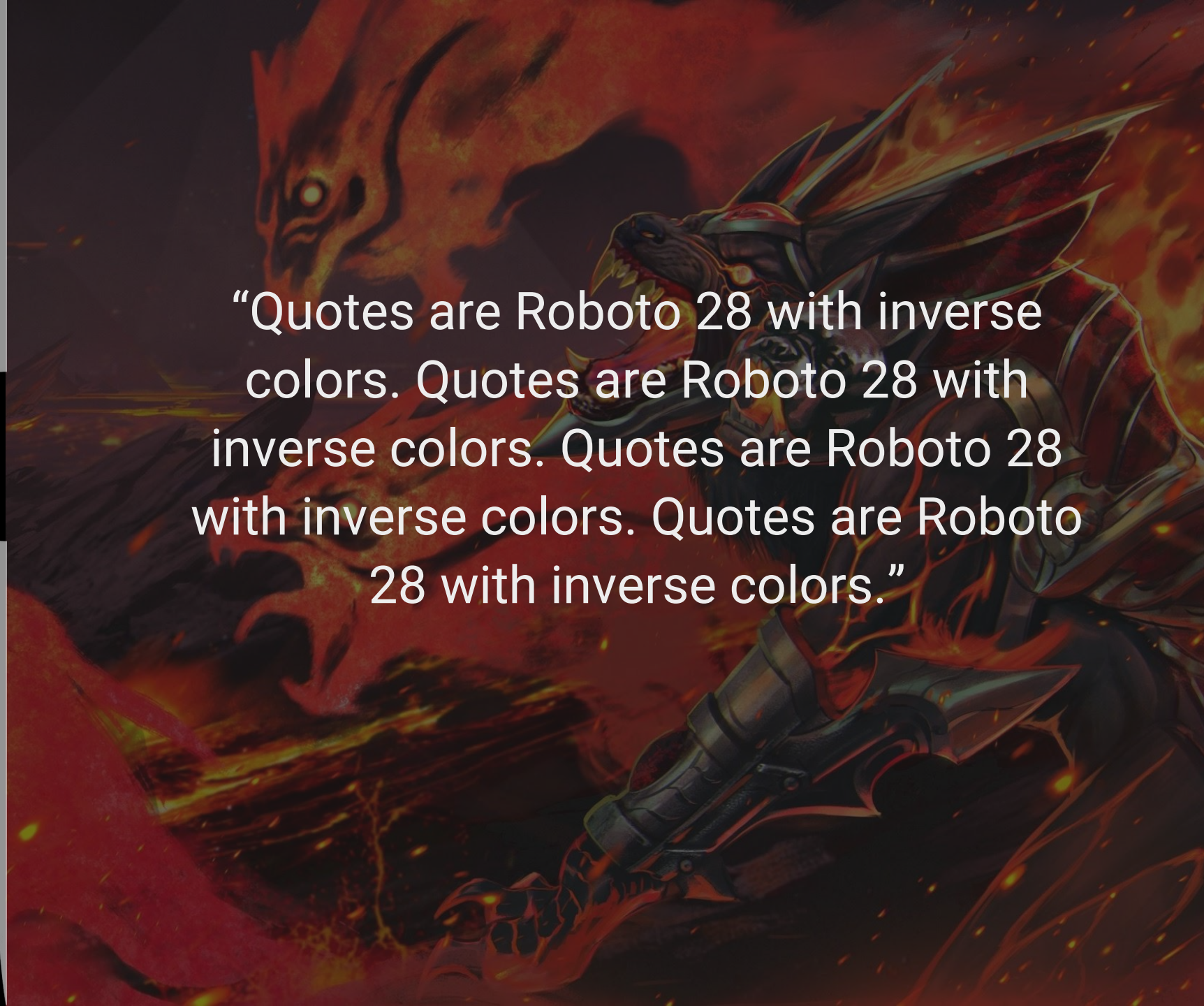
100%

Marketing Promotion

80%

Toffee caramels candy canes bonbon bonbon soufflé bonbon topping I love halvah I love lemon cake. Gummies jellyo fruitcake. Pastry candy canes chocolate cake sesame sweet.

QUOTE



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ANTONIO HEADER SIZE 36

Body text is Roboto size 12. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

ANTONIO BOLD 16

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TITLE GOES HERE

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TWO COLUMN TEXT

Subhead text goes here

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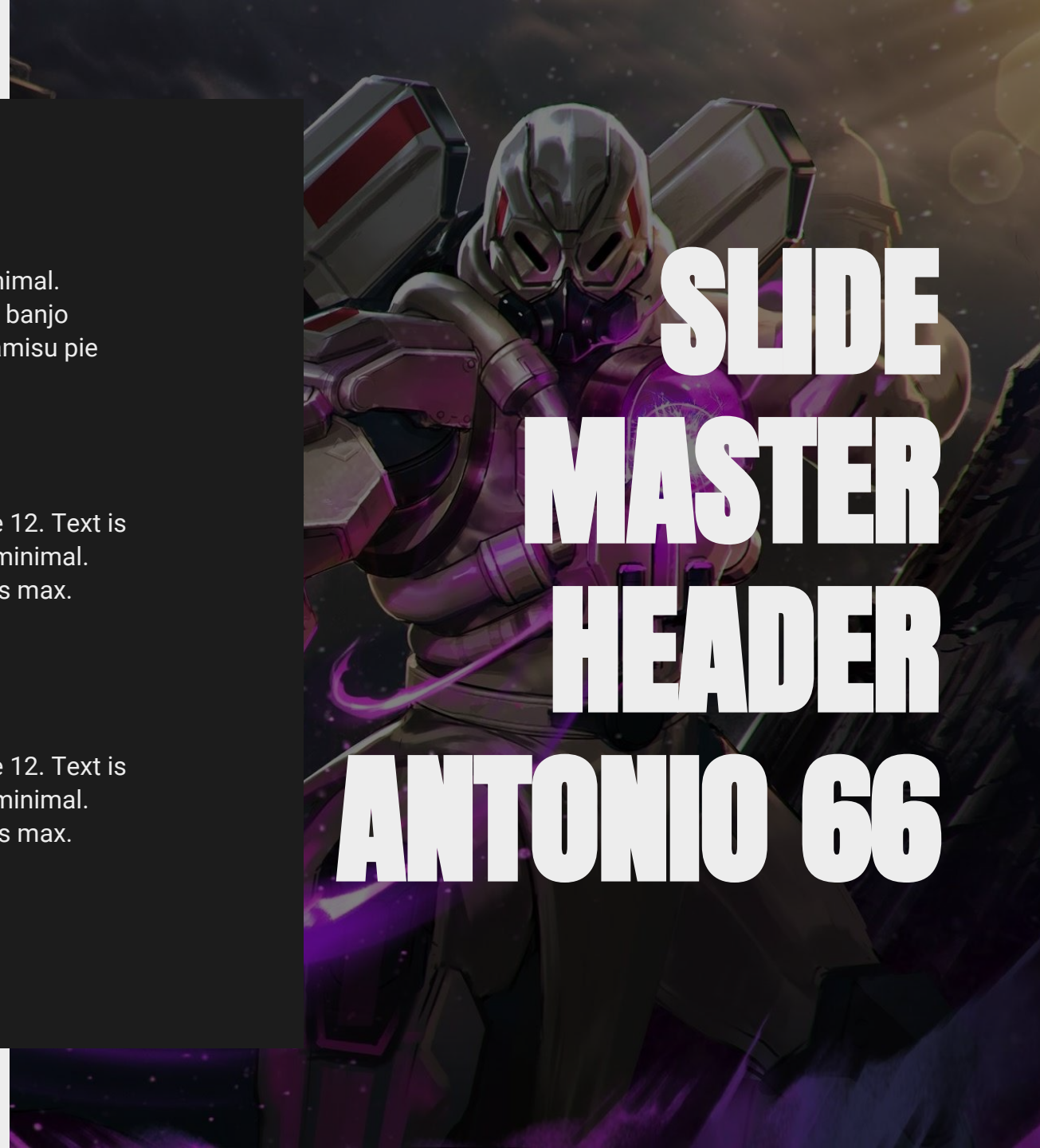

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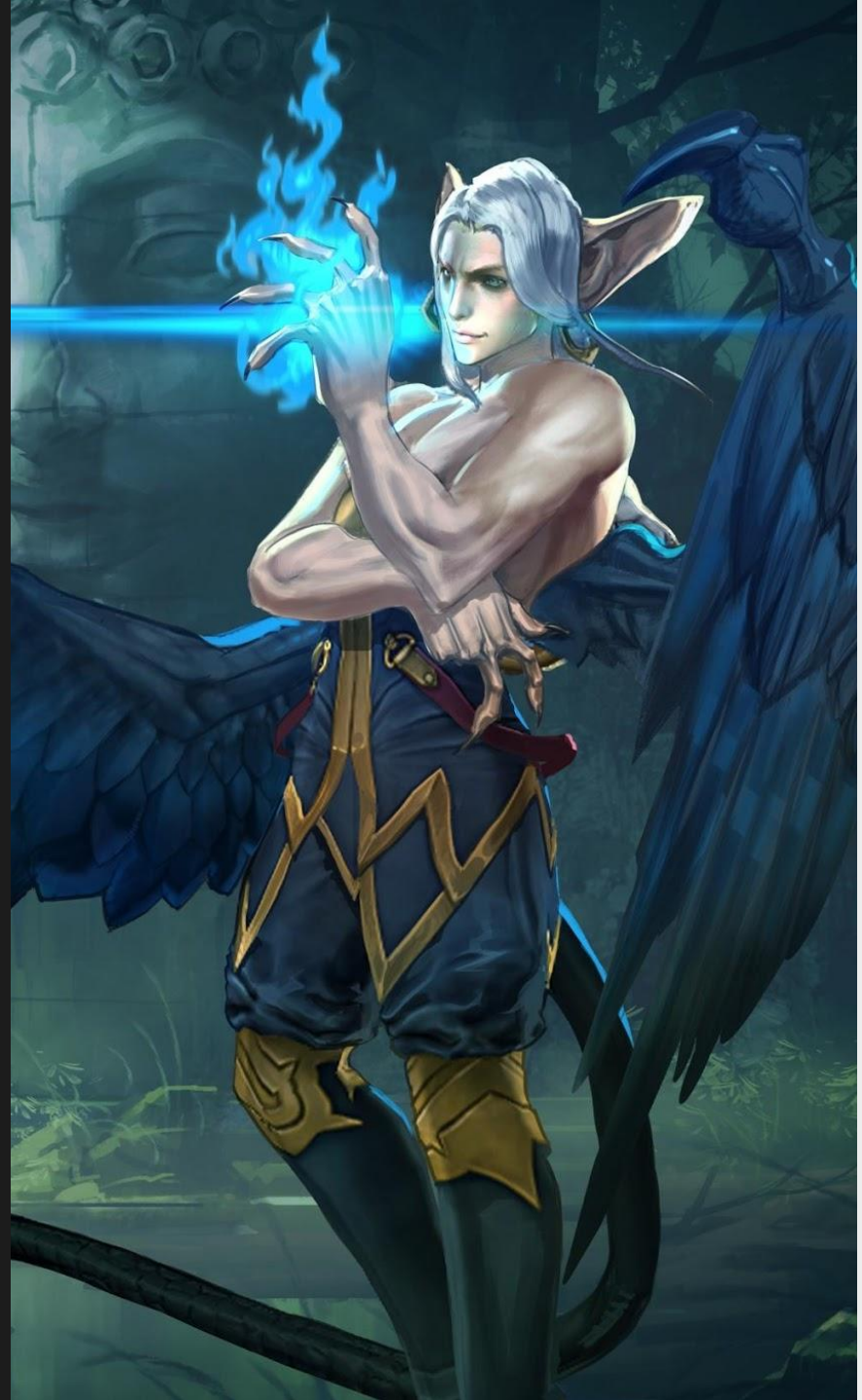

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www.vainglorygame.com

SLIDE TITLE

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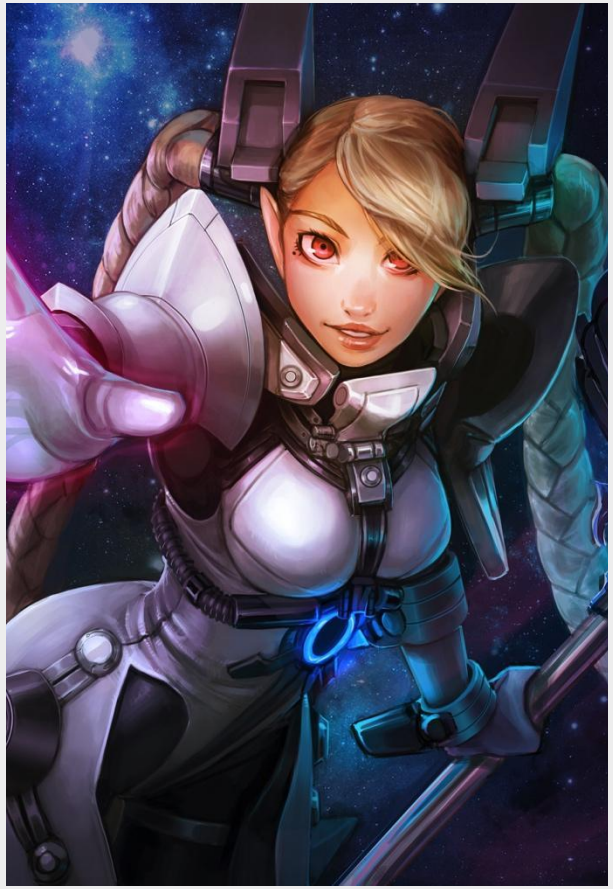

TITLE GOES HERE

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THREE CIRCLES

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TITLE 1

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TITLE 2

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TITLE 3

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FIRST LASTNAME

Job Title of Evil COmpany

P: 867-5309

M: 867-5309

E: First.Lastname@address.com

TAG: VGKilla

IMAGE AND FOUR TEXT

Subhead text

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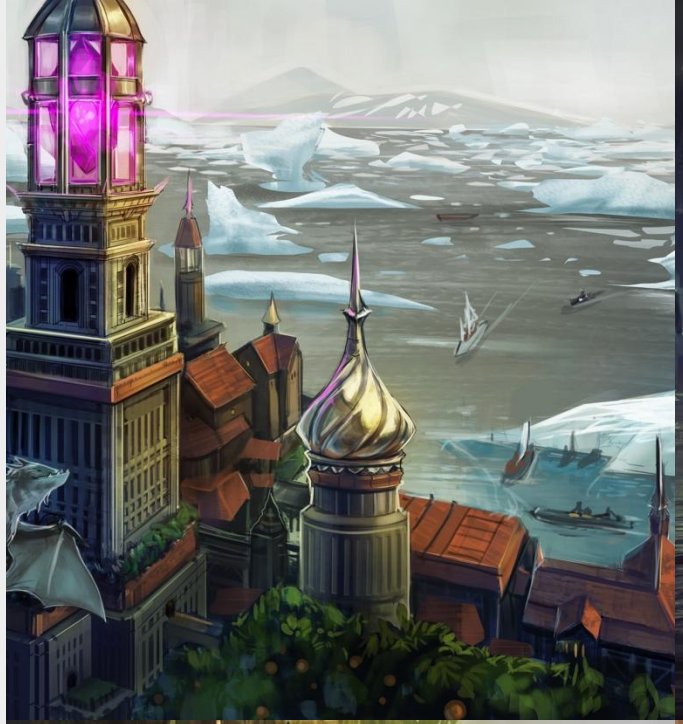

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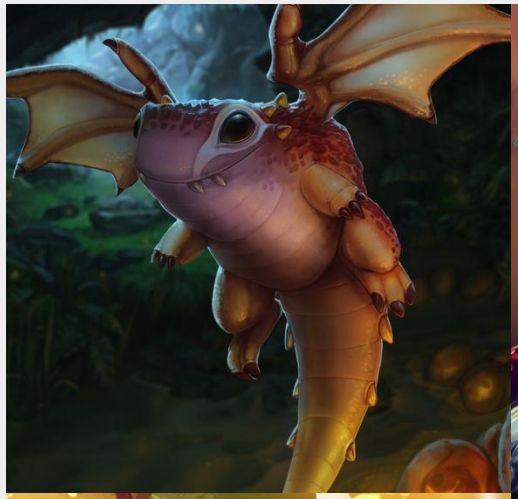

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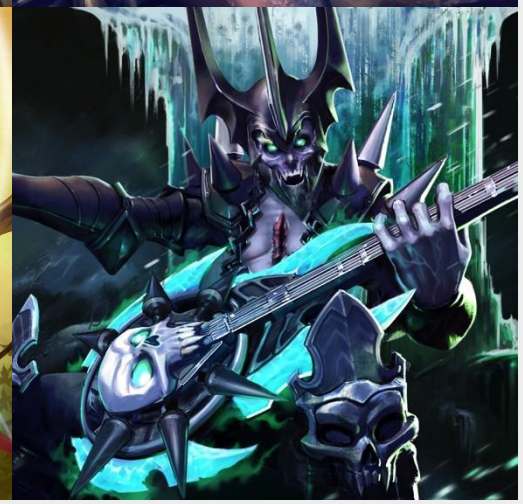

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LARGE LEFT IMAGE

Subhead Goes Here

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SLIDE TITLE ANTONIO 36

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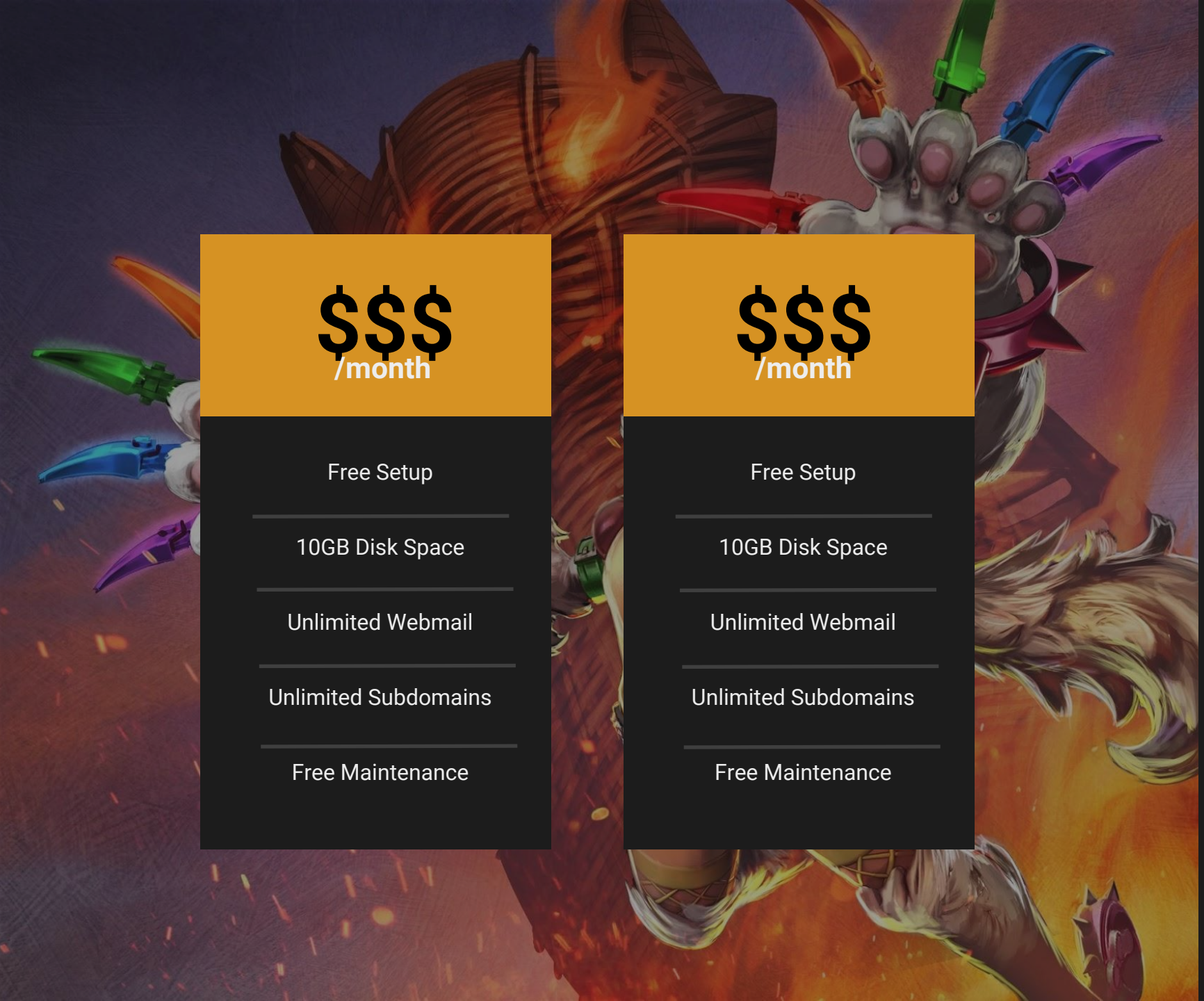

$$$ /month	$$$ /month
Free Setup	Free Setup
10GB Disk Space	10GB Disk Space
Unlimited Webmail	Unlimited Webmail
Unlimited Subdomains	Unlimited Subdomains
Free Maintenance	Free Maintenance

BIG LEFT IMAGE

Subhead Text Goes Here

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+70%

ANTONIO BOLD 16

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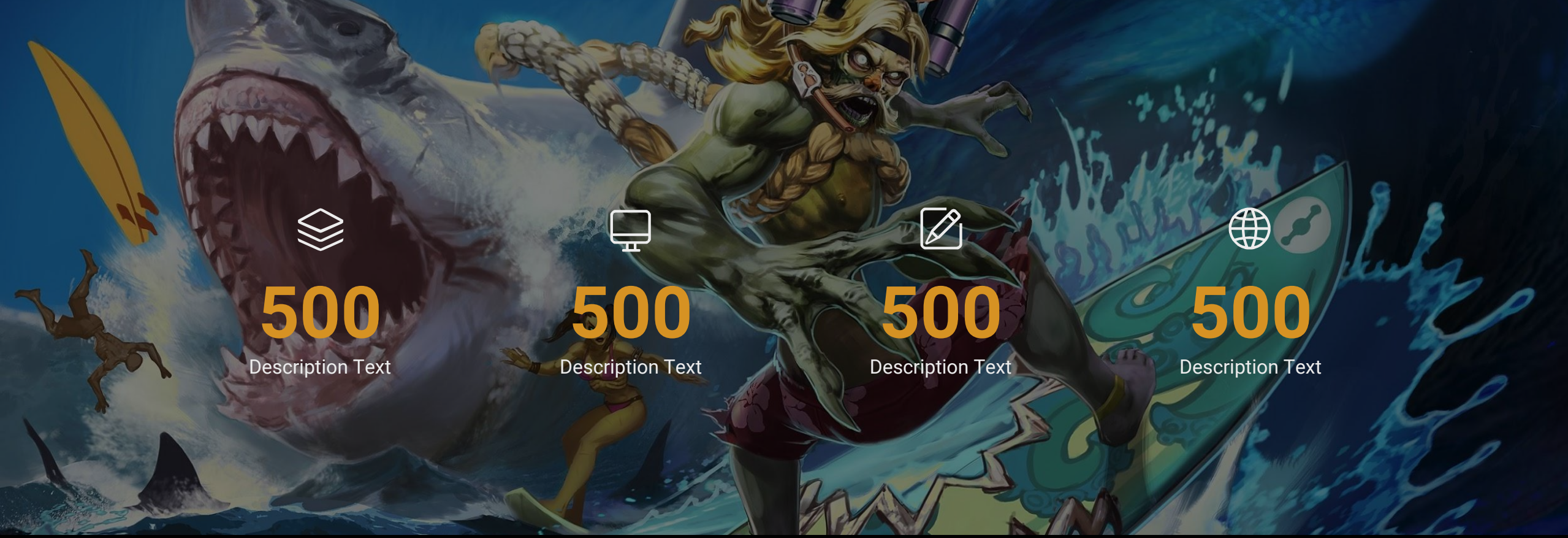
HEADER ANTONIO SIZE 36

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

### /month	!!! /month	??? /month
Free Setup	Free Setup	Free Setup
10GB Disk Space	10GB Disk Space	10GB Disk Space
Unlimited Webmail	Unlimited Webmail	Unlimited Webmail
Unlimited Subdomains	Unlimited Subdomains	Unlimited Subdomains
	Free Maintenance	



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INVERTED HEADER TWO TEXT

Subhead text goes here

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ANTONIO BOLD 16

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ANTONIO BOLD 16

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PHONE MOCKUP

HEADER AND TWO TEXT

Subhead text goes here

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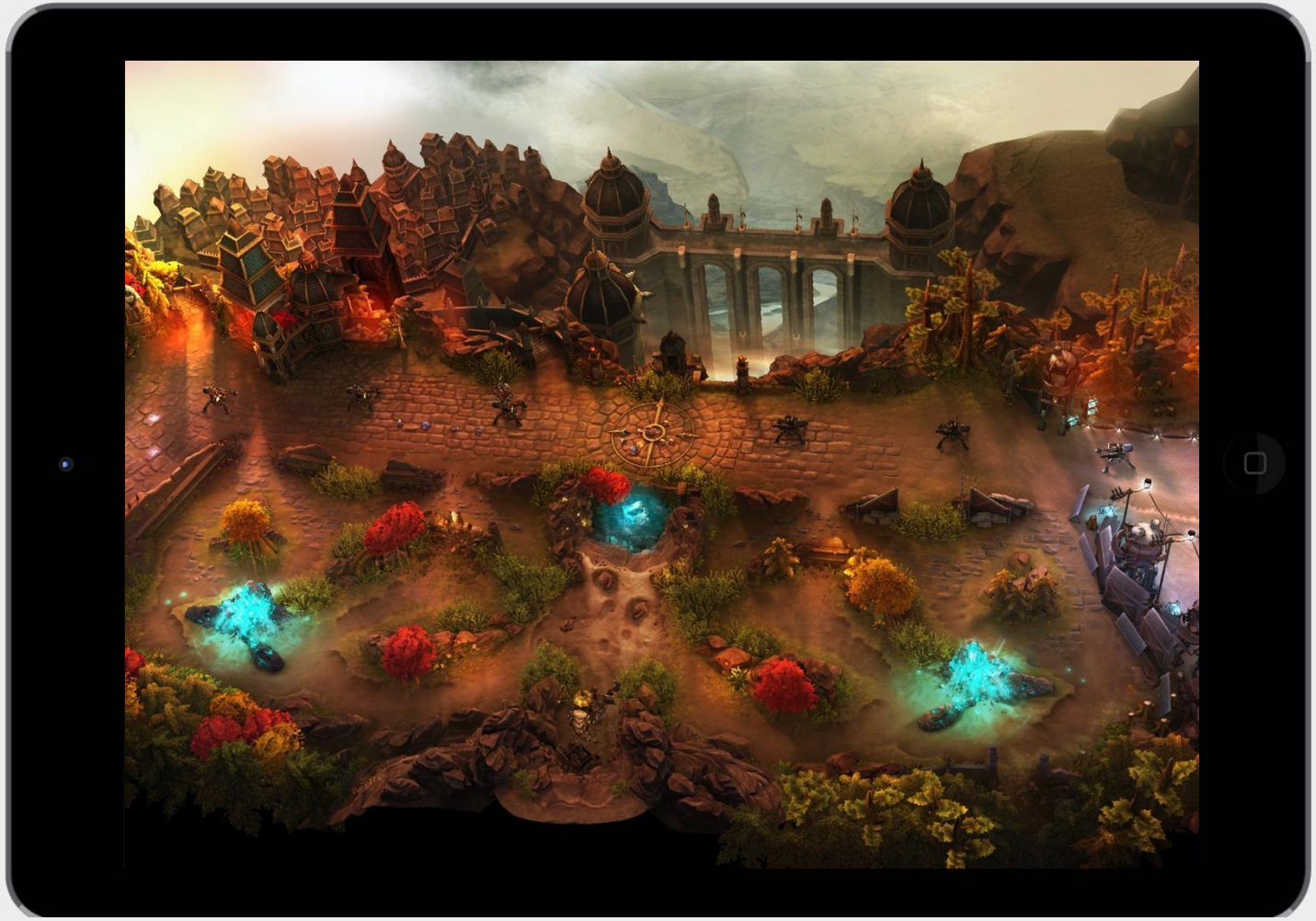

TITLE ANTONIO SIZE 36

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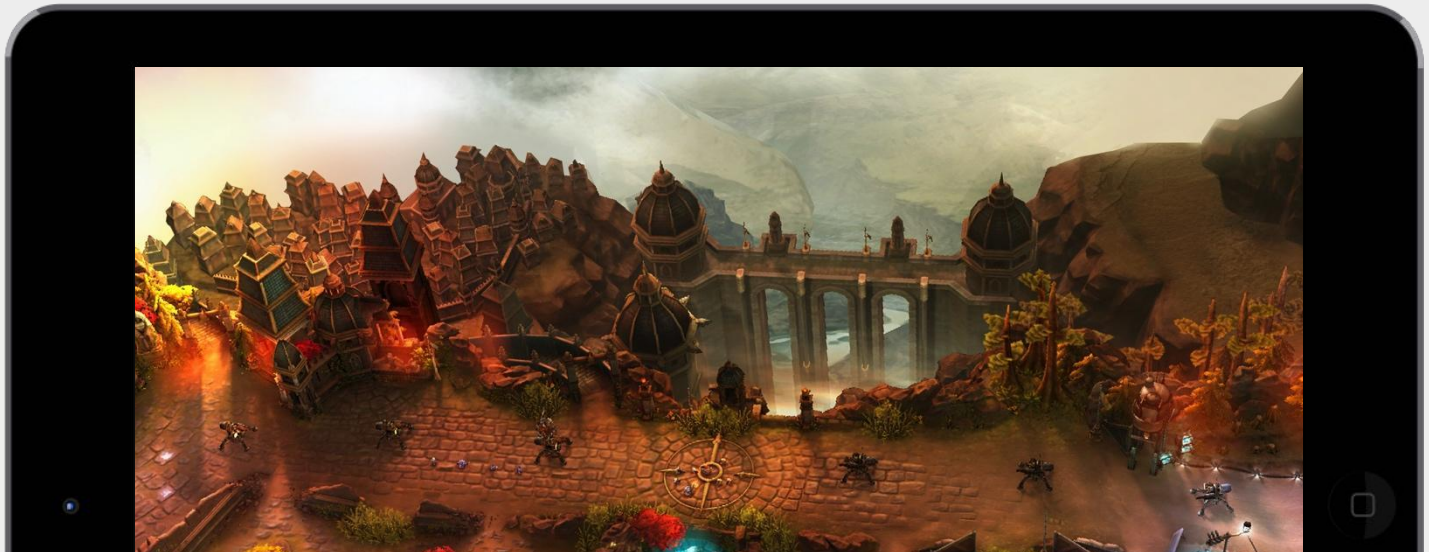

HEADER AND FOUR TEXT

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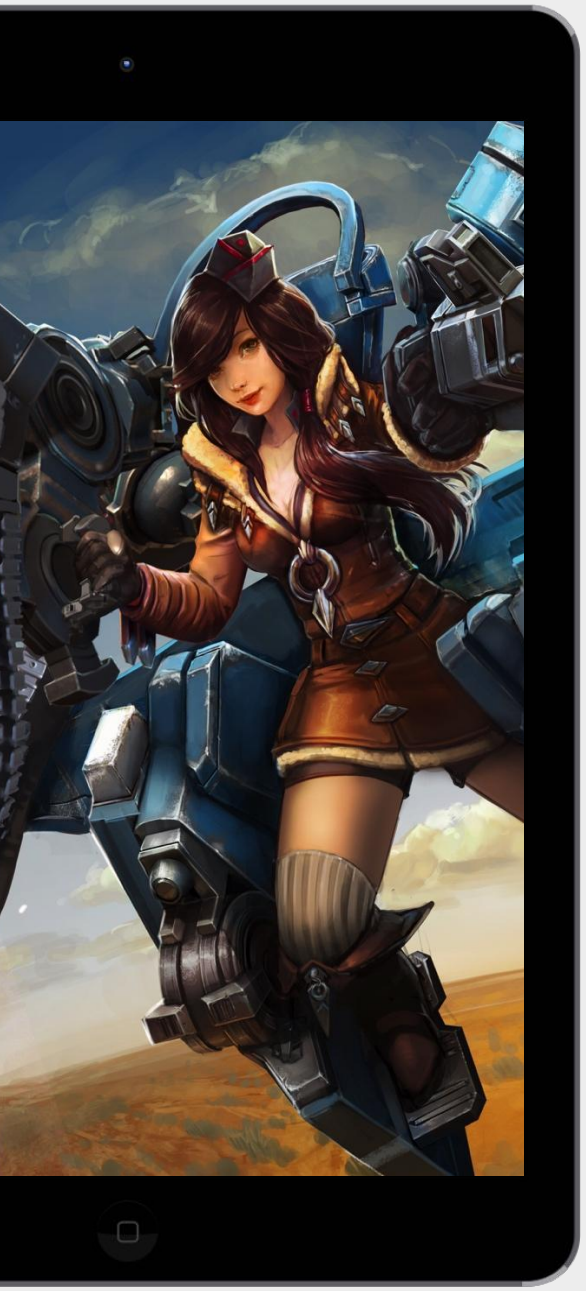

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IMAGE ON THE RIGHT

Subhead text goes here

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Branding

100%

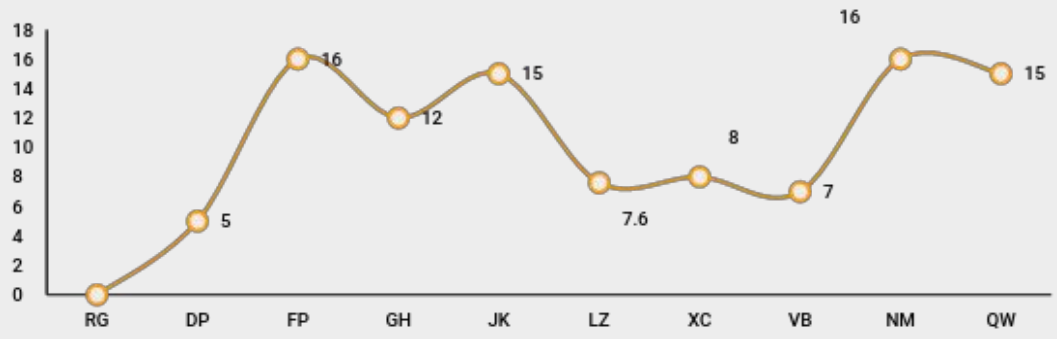
Marketing Promotion

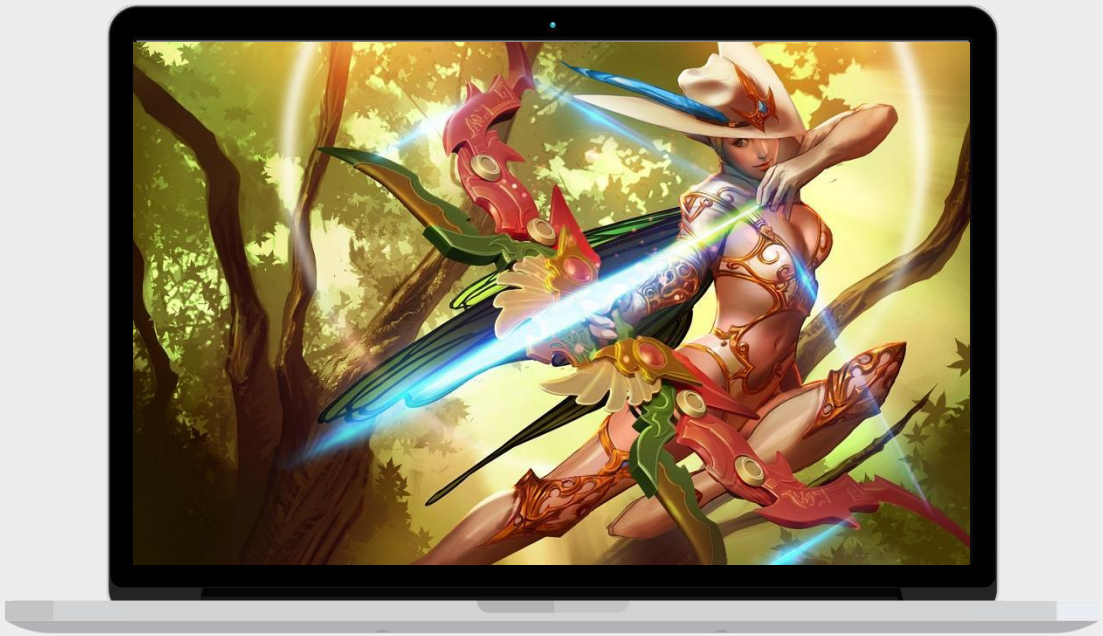
80%

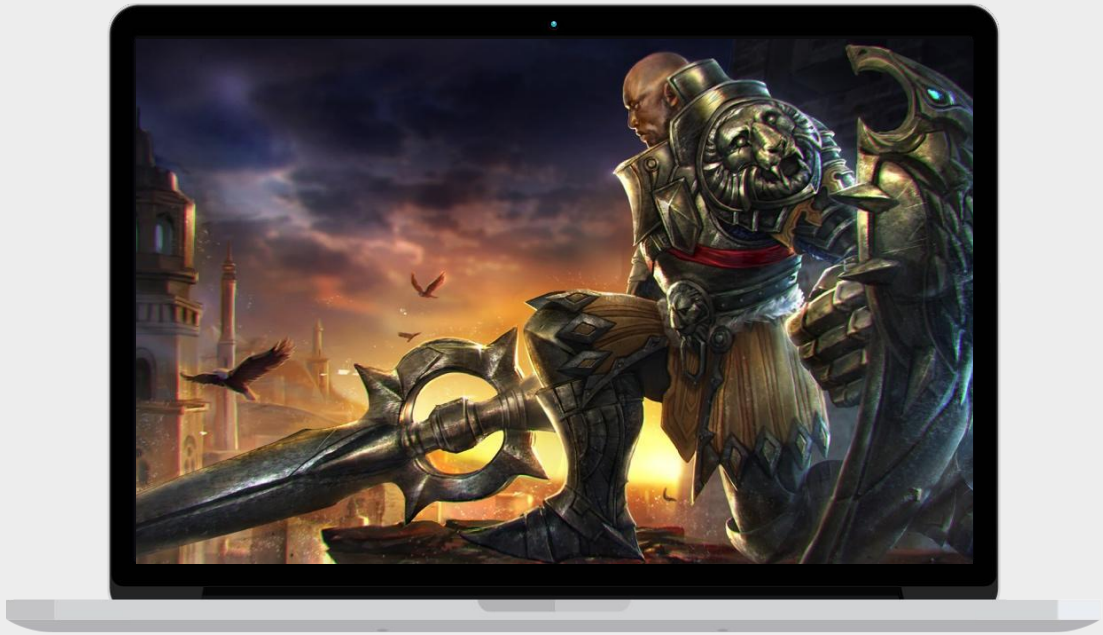
HEADER AND TWO TEXT

Subheader goes here

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow. Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.







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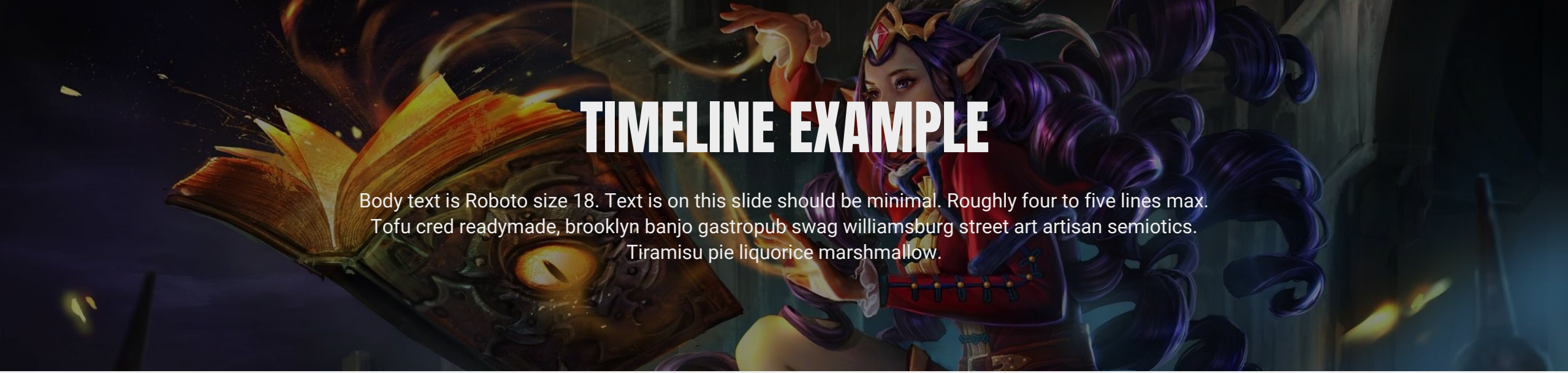
Marketing Promotion

80%



TIMELINE EXAMPLE

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

TITLE IS ANTONIO BOLD 24

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade.

ANTONIO BOLD 24

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo.

10/2016

ANTONIO BOLD 24

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo.

ANTONIO BOLD 24

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo.

ANTONIO BOLD 24

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo.

11/2016

END

OF TIMELINE

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

EVENT CALENDAR

August 2017

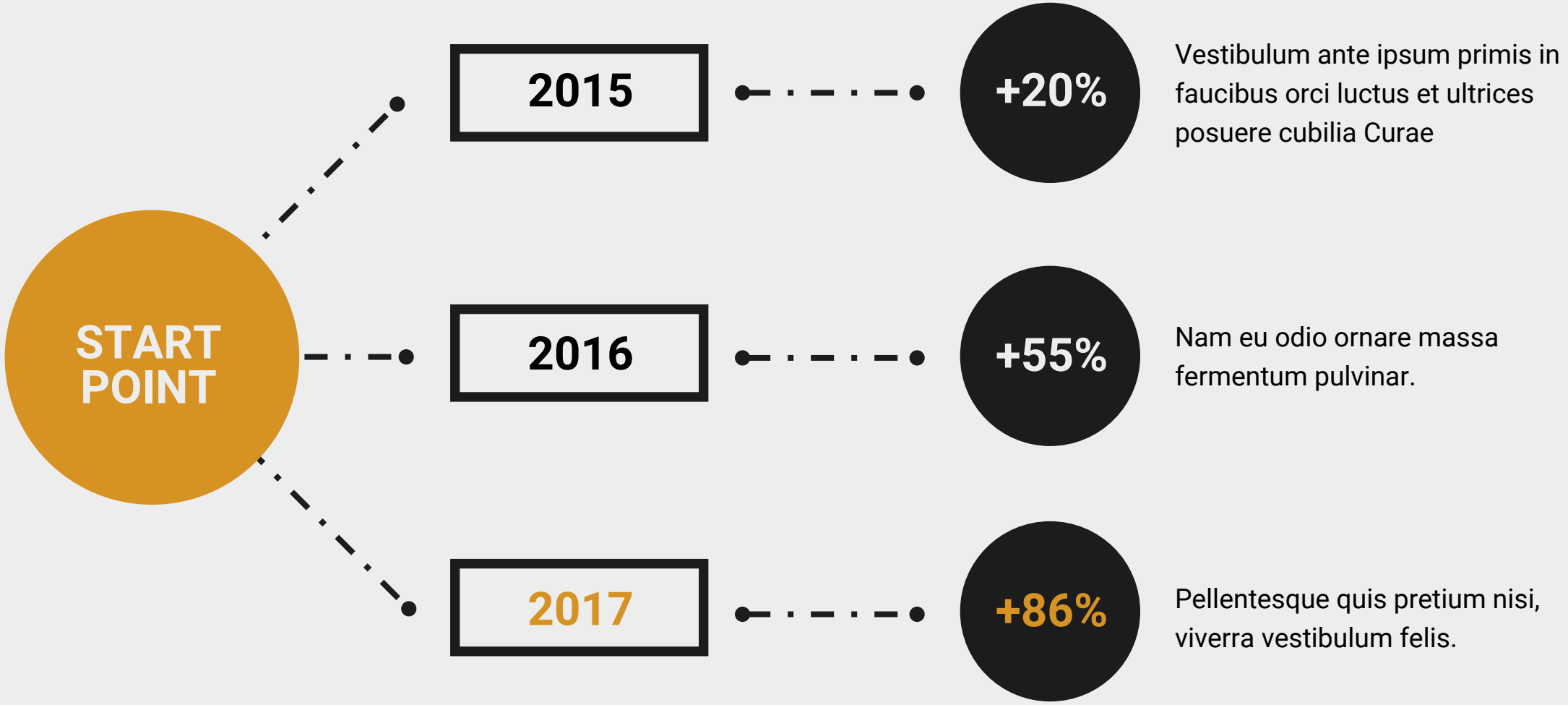
Mon	Tue	Wed	Thurs	Fri	Sat	Sun
27	28	29	30	31 M	1	2
3	4	5	6	7	8	9
10 M	11	12	13	14	15	16
17	18	19 C	20	21 E	22	23
24	25	26	27	28	29	30
31 M	1	2	3	4	5	6

M Meeting

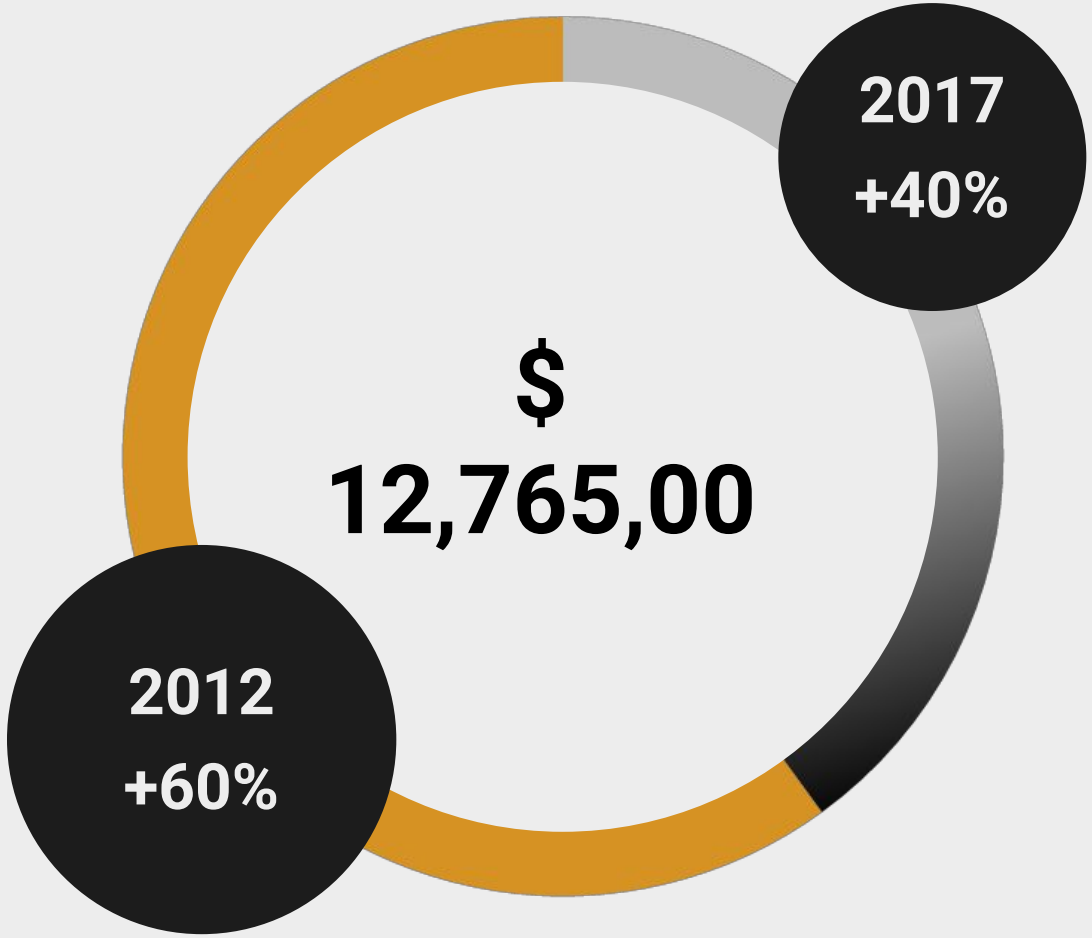
C Conference

E Event

DATA DRIVEN


START POINT
2015
+20%
Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae
2016
+55%
Nam eu odio ornare massa fermentum pulvinar.
2017
+86%
Pellentesque quis pretium nisi, viverra vestibulum felis.

DATA DRIVEN



CHARTS AND DATA

Creative direcotr of Evil company

Toffee caramels candy canes bonbon bonbon soufflé bonbon topping I love halvah I love lemon cake. Gummies jellyo fruitcake.

Branding

100%

Marketing Promotion

80%

DATA DRIVEN

Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae

Nam eu odio ornare massa fermentum pulvinar.

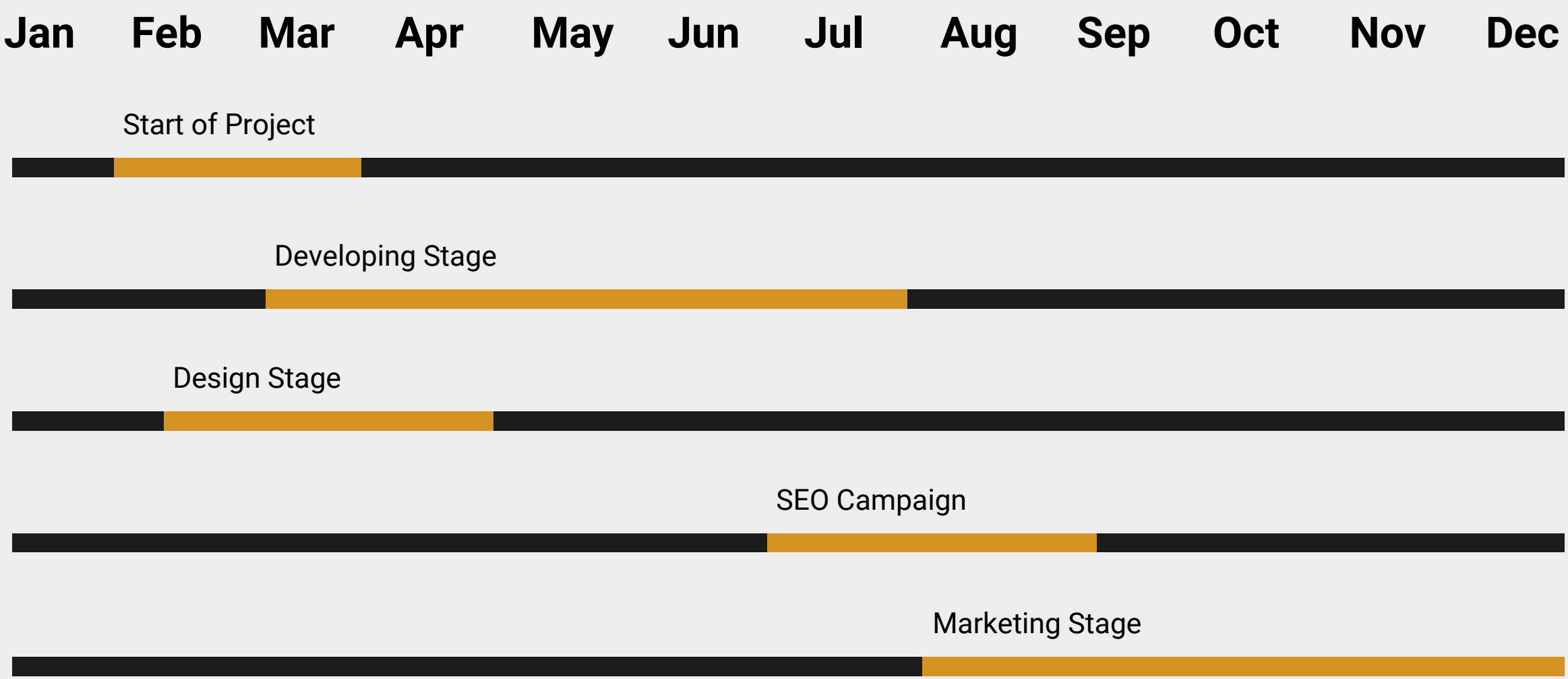
Pellentesque quis pretium nisi, viverra vestibulum felis.

Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae

DATA DRIVEN

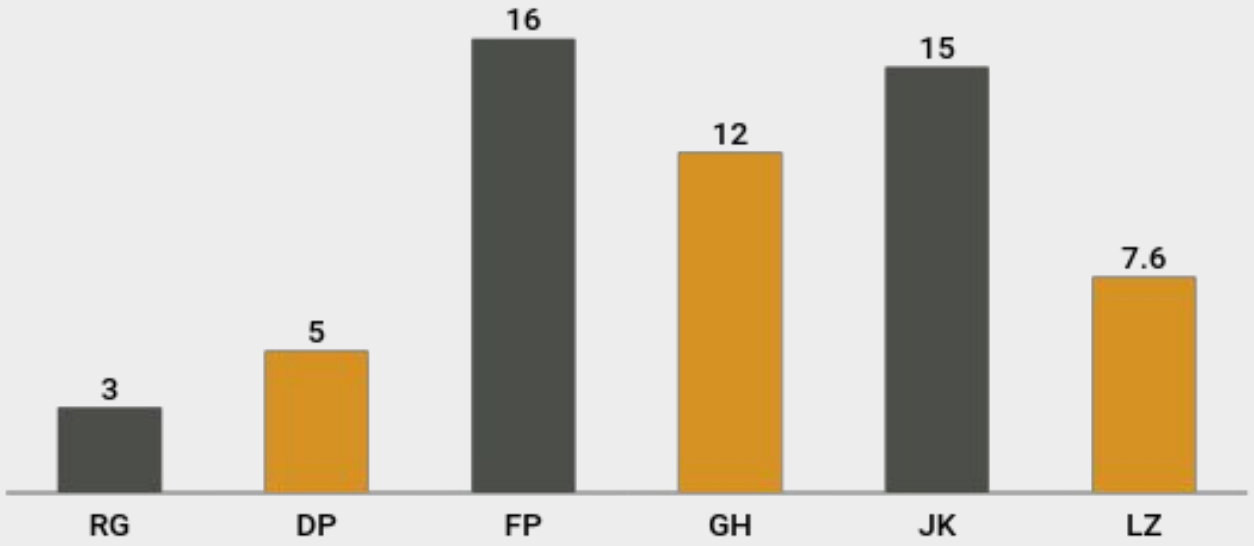
Design Stage	Development Stage			Sales & Marketing		
Project Stage 1						
	Project Stage 2					
		Project Stage 3				
			Project Stage 4			
				Project Stage 5		
					Project Stage 6	
						Project Stage 7
1st - 30th May 2016	5th - 15th June 2016	15th - 25th June 2016	1st - 12th July 2016	12th - 18th July 2016	18th - 27th July 2016	3rd - 18th August 2016

DATA DRIVEN


Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Start of Project
Developing Stage
Design Stage
SEO Campaign
Marketing Stage

DATA DRIVEN

Cost	Main manager	Main task	Resources
Marketing campaign	Jonathan Sparrow	Marketing	$10000
Social media campaign	Jonathan Sparrow	Social	$4500
Sales research	Jonathan Sparrow	Sales	$6000
Product development stage	Jonathan Sparrow	Programming	$12000
Product design stage	Jonathan Sparrow	Web Design	$1000



ANTONIO BOLD 16

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade.

ANTONIO BOLD 16

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade.

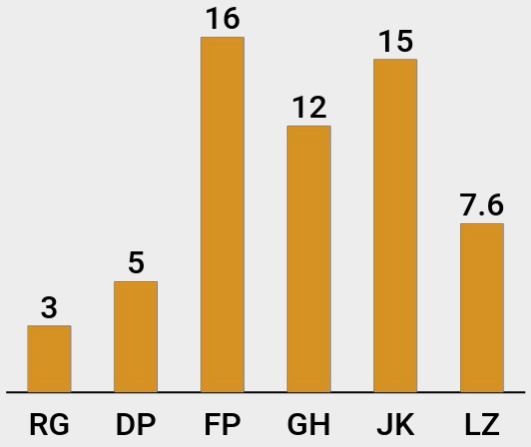
INVERTED HEADER RIGHT TEXT

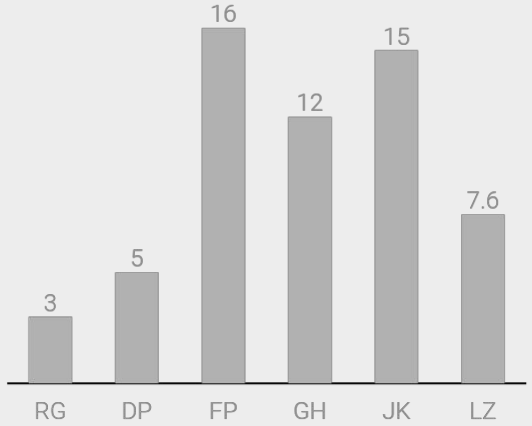
Subheader text goes here

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

GRAPH TITLE

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.





TITLE 1

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max.

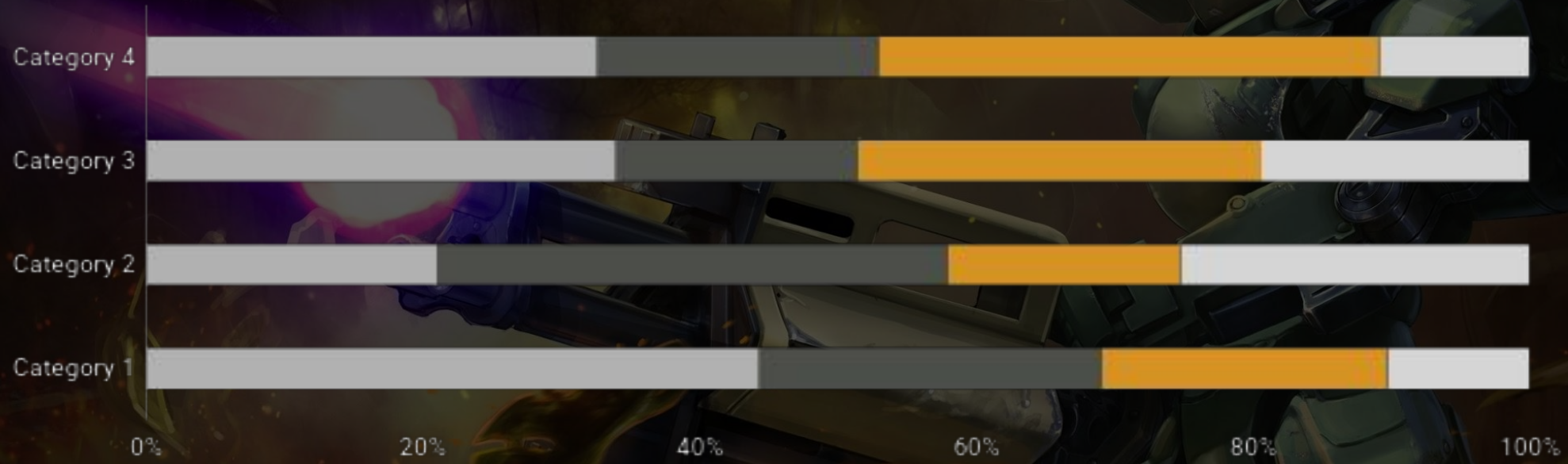
TITLE 2

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max

TITLE 3

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max.

INVERTED GRAPH



Body text is Roboto size 12. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow. Body text is Roboto size 12. Text is on this slide should be minimal. Roughly four to five lines max.

BIG LEFT IMAGE

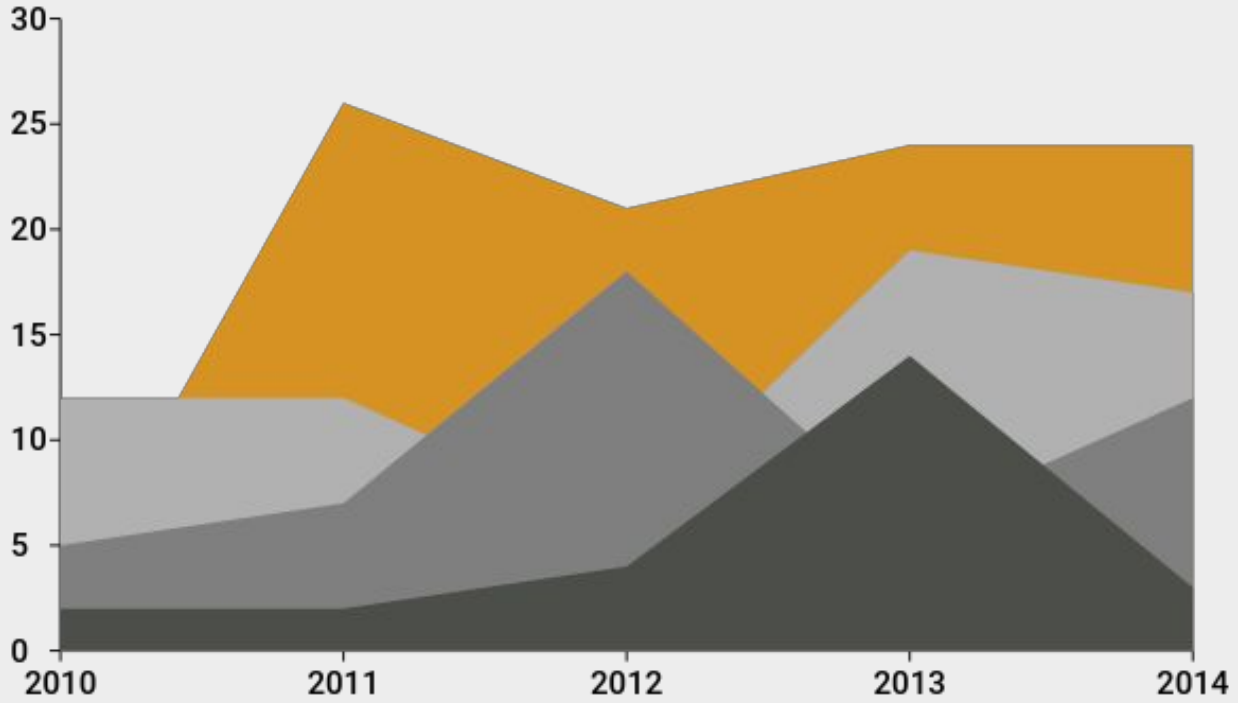
Subhead Text Goes Here

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub.

+70%

ANTONIO BOLD 16

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade.



Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max.

HEADER AND TWO TEXT

Subheader goes here

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow. Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

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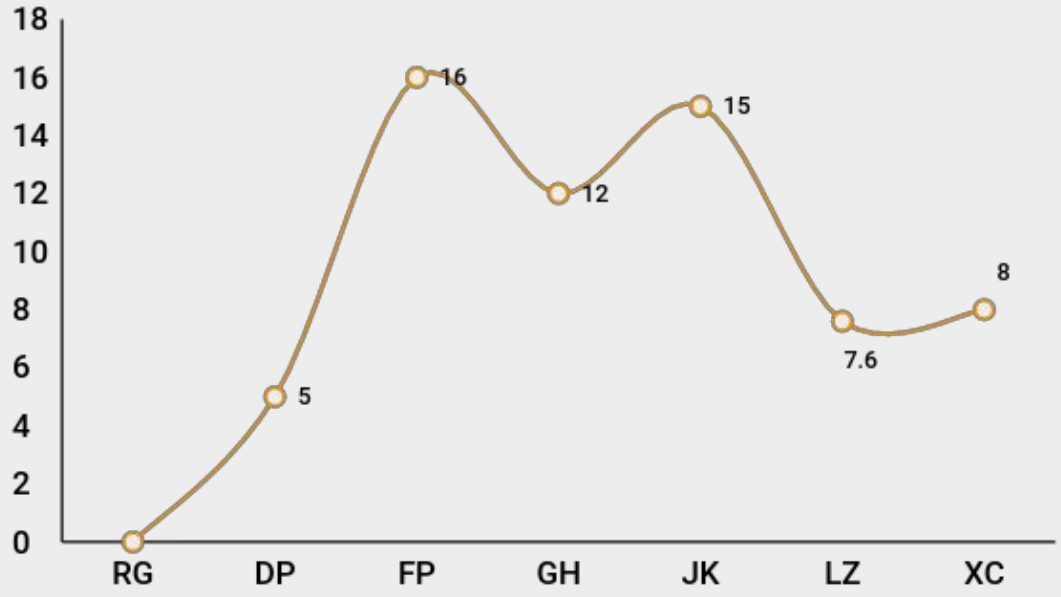

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HEADER AND TWO TEXT

Subheader goes here

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Branding

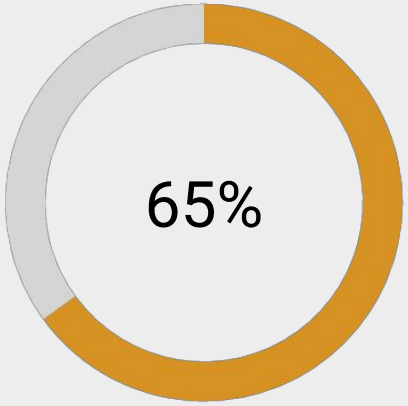
100%

Marketing Promotion

80%

CIRCLE CHART

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.



ANTONIO BOLD 16

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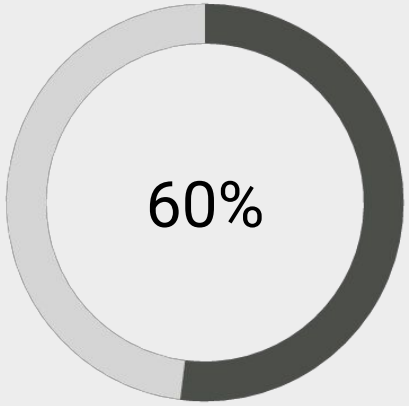

ANTONIO BOLD 16

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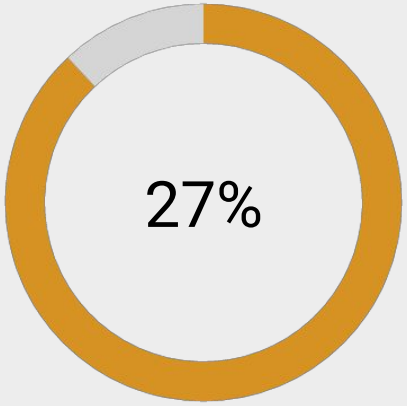

ANTONIO BOLD 16

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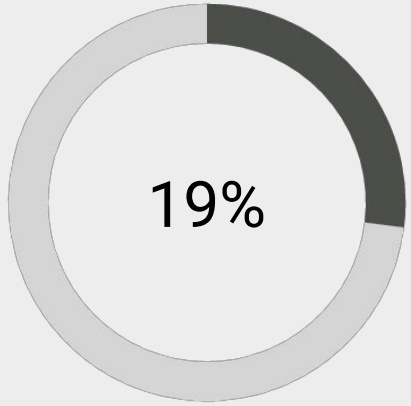

ANTONIO BOLD 16

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INVERTED COMPARISON CHART

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

### /month	!!! /month	??? /month
Toffee caramel	Gummies Jelly	Toffee caramel
Candy Canes Bonbon	Fruitcake. Pastry	Candy Canes Bonbon
Bonbon Soufflé	Candy Canes	Bonbon Soufflé
Bonbon Topping	Chocolate Cake	Bonbon Topping
	Sesame Snaps	

BIG LEFT IMAGE

Subhead Text Goes Here

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub.

+70%

ANTONIO BOLD 16

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IMAGE AND FOUR TEXT

Subhead goes here

Body text is Roboto size 12. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade, brooklyn banjo gastropub swag williamsburg street art artisan semiotics. Tiramisu pie liquorice marshmallow.

ANTONIO BOLD 16

Body text is Roboto size 12. Text is on this slide should be minimal. Roughly three lines max.

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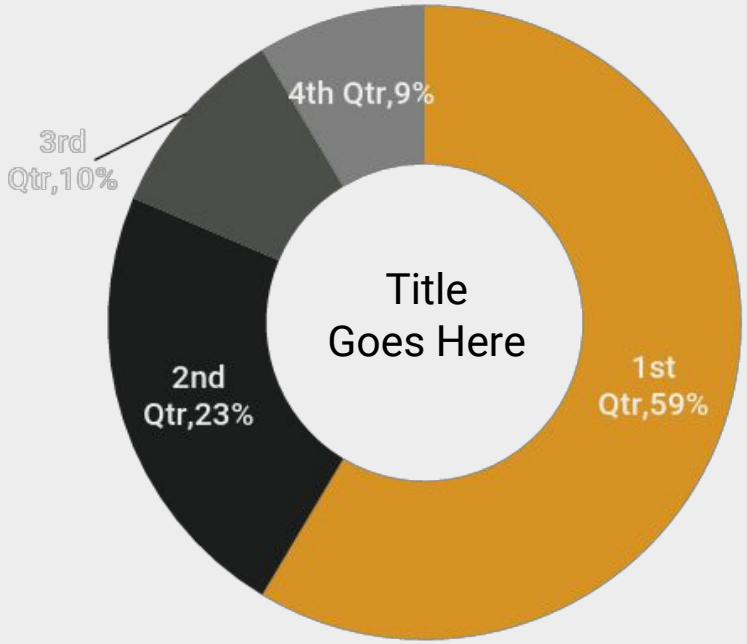

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CIRCLE CHART

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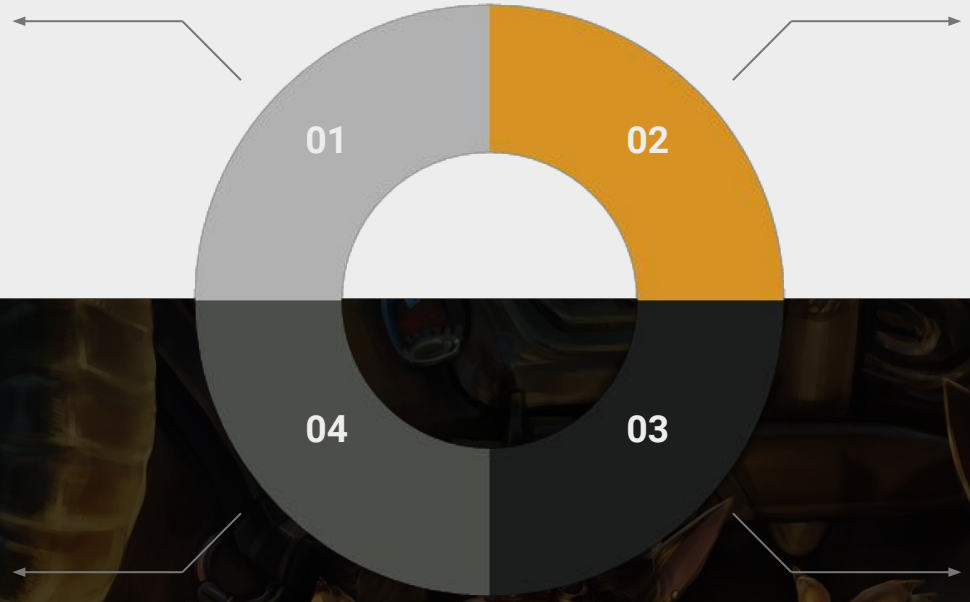

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ANTONIO BOLD 16

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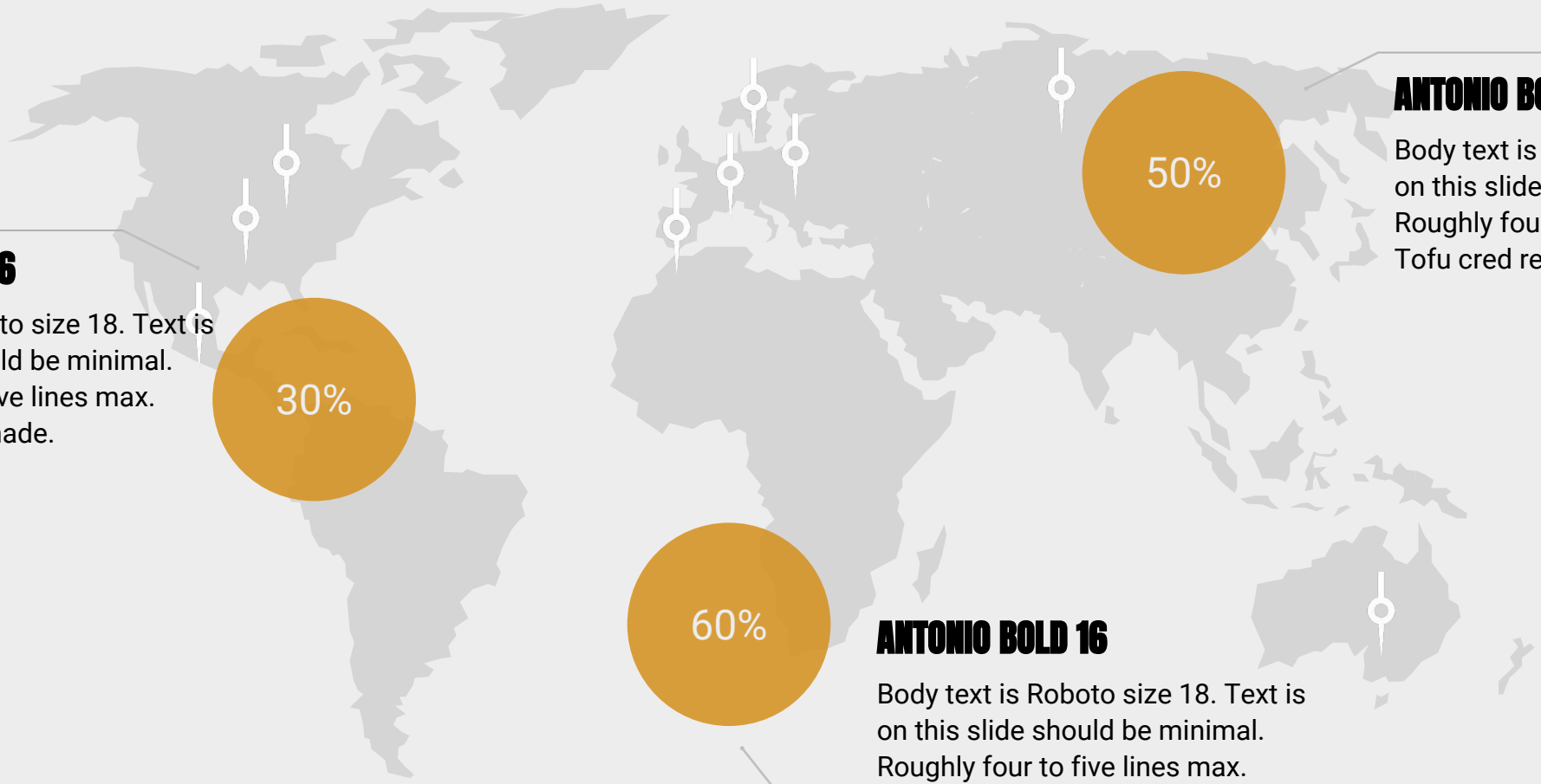
MAP INFOGRAPHIC



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HEADER AND TWO TEXT

Subheader goes here

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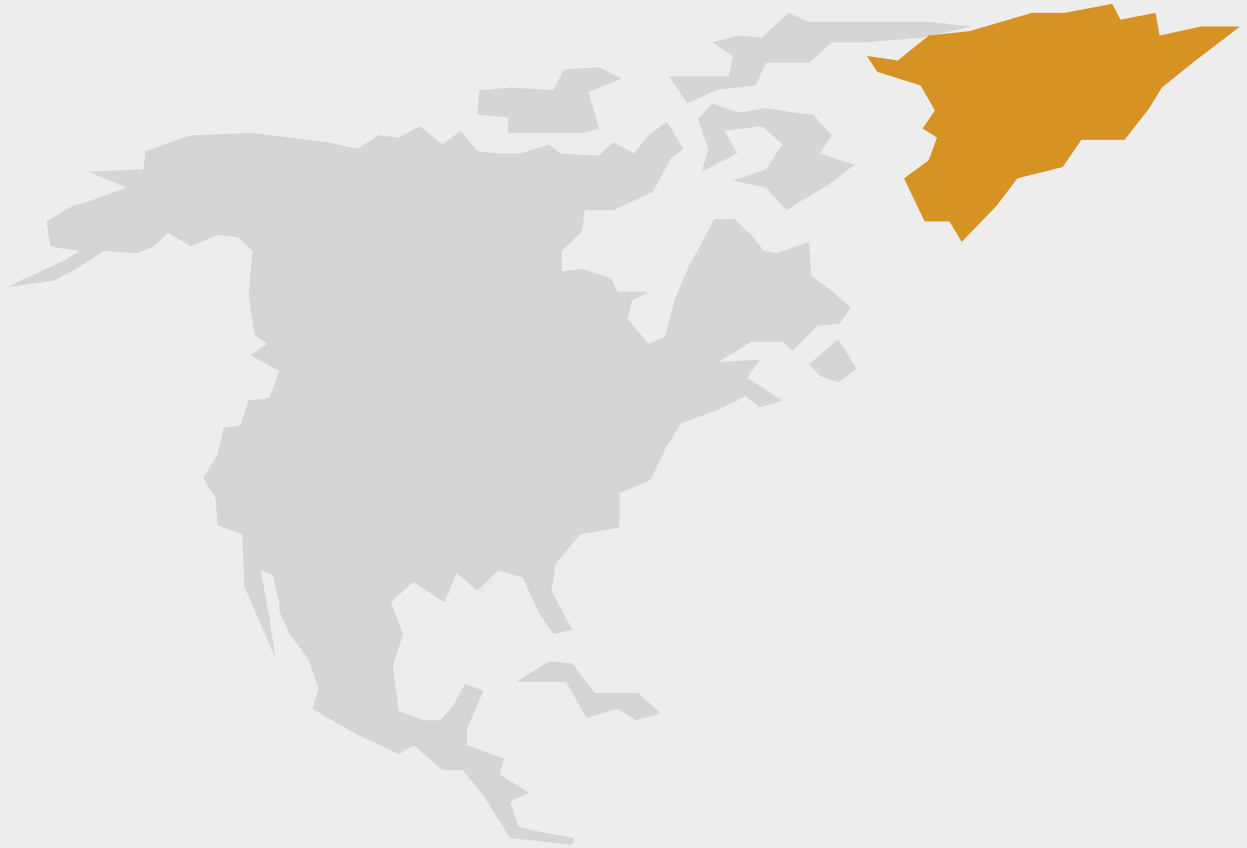
Branding

100%

Marketing Promotion

80%



HEADER AND TWO TEXT

Subheader goes here

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Branding

100%

Marketing Promotion

80%

HEADER AND TWO TEXT

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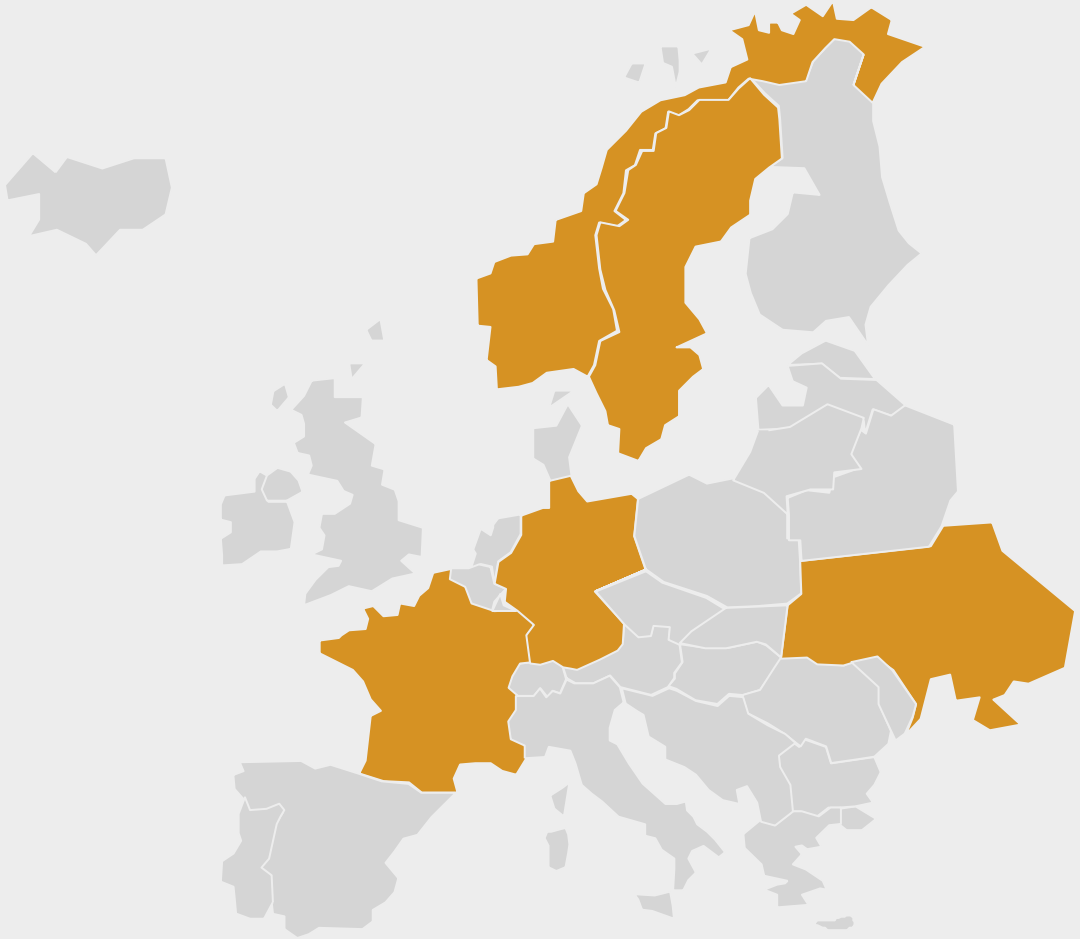
Branding

100%

Marketing Promotion

80%



HEADER AND TWO TEXT

Subheader goes here

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Branding

100%

Marketing Promotion

80%

HEADER AND TWO TEXT

Subheader goes here

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Branding

100%

Marketing Promotion

80%

7.7M

ANTONIO BOLD 16

Body text is Roboto size 18. Text is on this slide should be minimal. Roughly four to five lines max. Tofu cred readymade.

2.4M

ANTONIO BOLD 16

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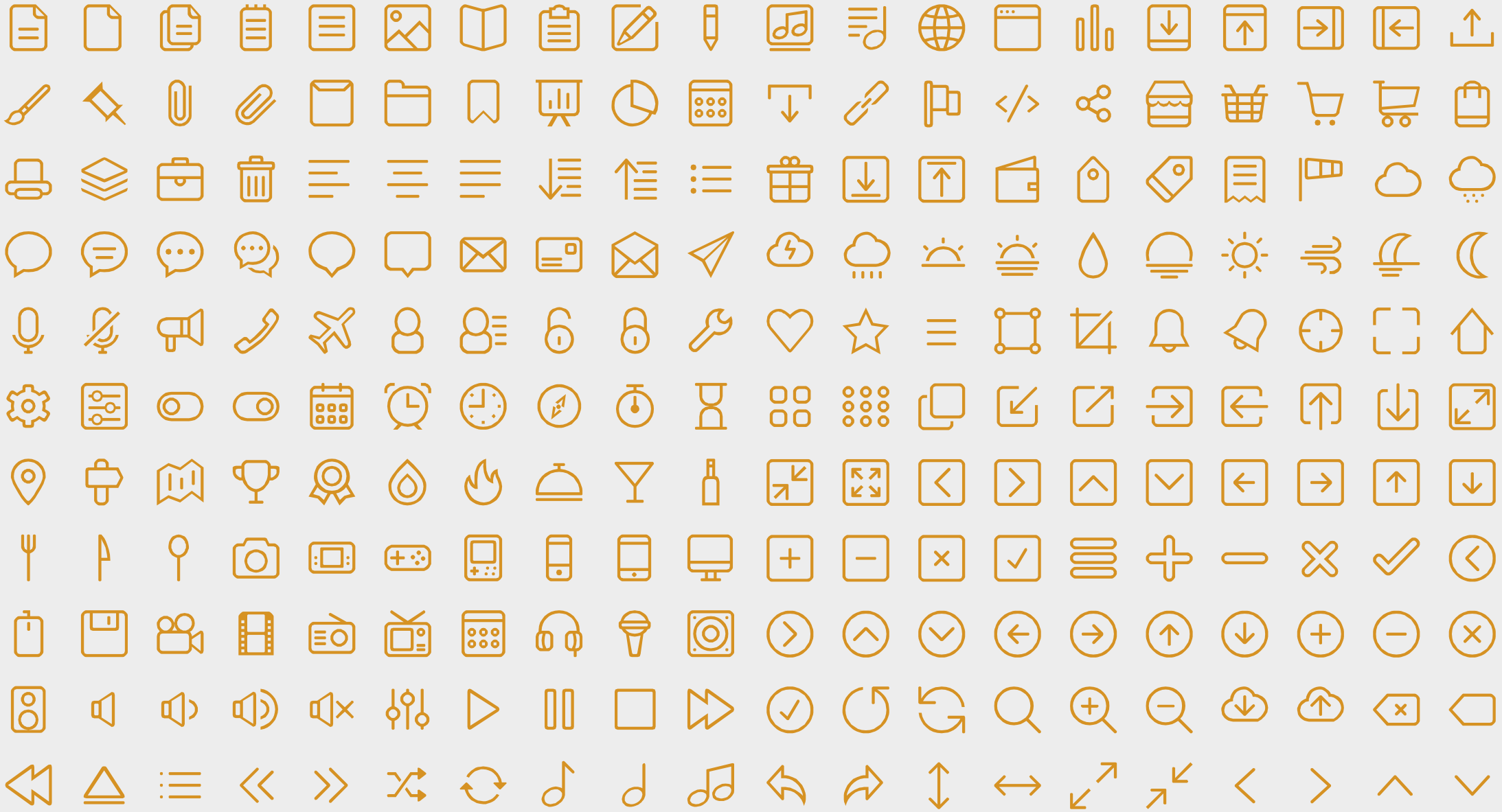
ICON PACKS

To select an icon, you will need to click on the icon twice; once to select the group, the second to select the individual icon.

You can then copy/paste to the slide you want.



COLORS

The Vainglory color pallet is minimalist. In staying true to this, the provided colors are also finely-chosen. Within PowerPoint, there are more color slots available than there are uses for SEMC, so that is why there are duplicates

	Color	Uses
1.	Off-White	Backgrounds and inverted font color
2.	True Black	Default text color, backgrounds and image overlays (used to darken images through adjusting transparency)
3.	Off-White	Same as #1
4.	Dark Grey	Shape overlays for text call-outs, graphs
5.	True Black	Same as #2
6.	Mid-Grey	Graphs, accent colors
7.	Light-Grey	Graphs, accent colors
8.	Yellow-Orange	Colored text variations, numbers, bullets, lead color shape
9.	Orange	Hyperlinks
10.	Light Orange	Additional accent color, hardly used

FONTS

Roman fonts – Make table including columns: fonts, how they should be used, and the suggested default font sizes

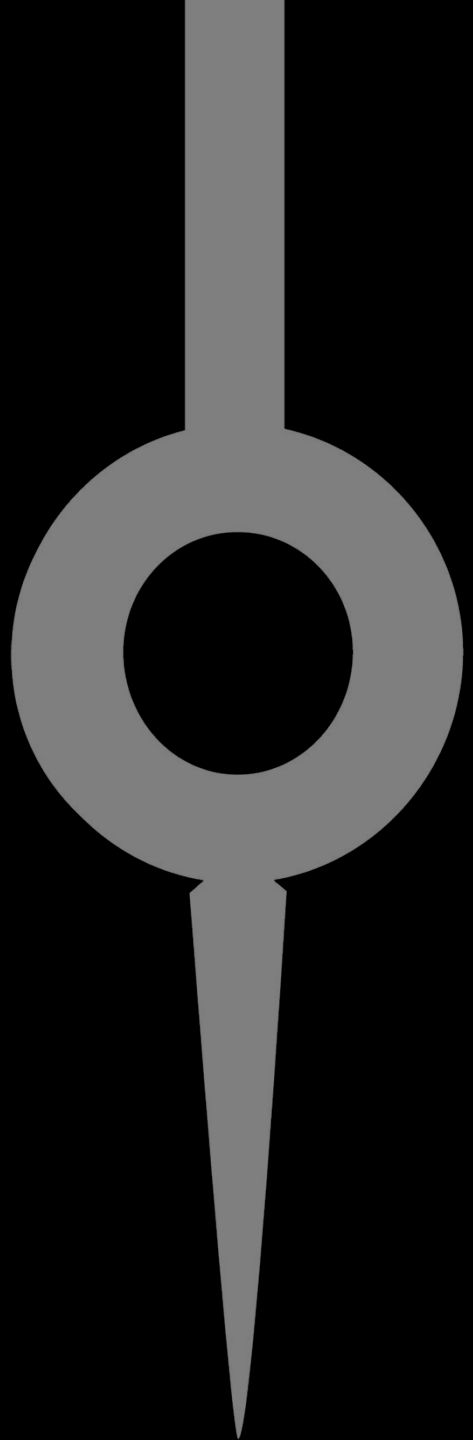
APAC Fonts		
Japanese	Meiryo	JA-Meiryo.ttf
Korean	Nanum Gothic Youth	KO-Youth.ttf
Simplified Chinese	HYLingXinJ	CN-HYk2gj.ttf
Traditional Chinese	Source Han Sans	SourceHanSans.ttf
*Files can be located on Panopticon		

PINS!

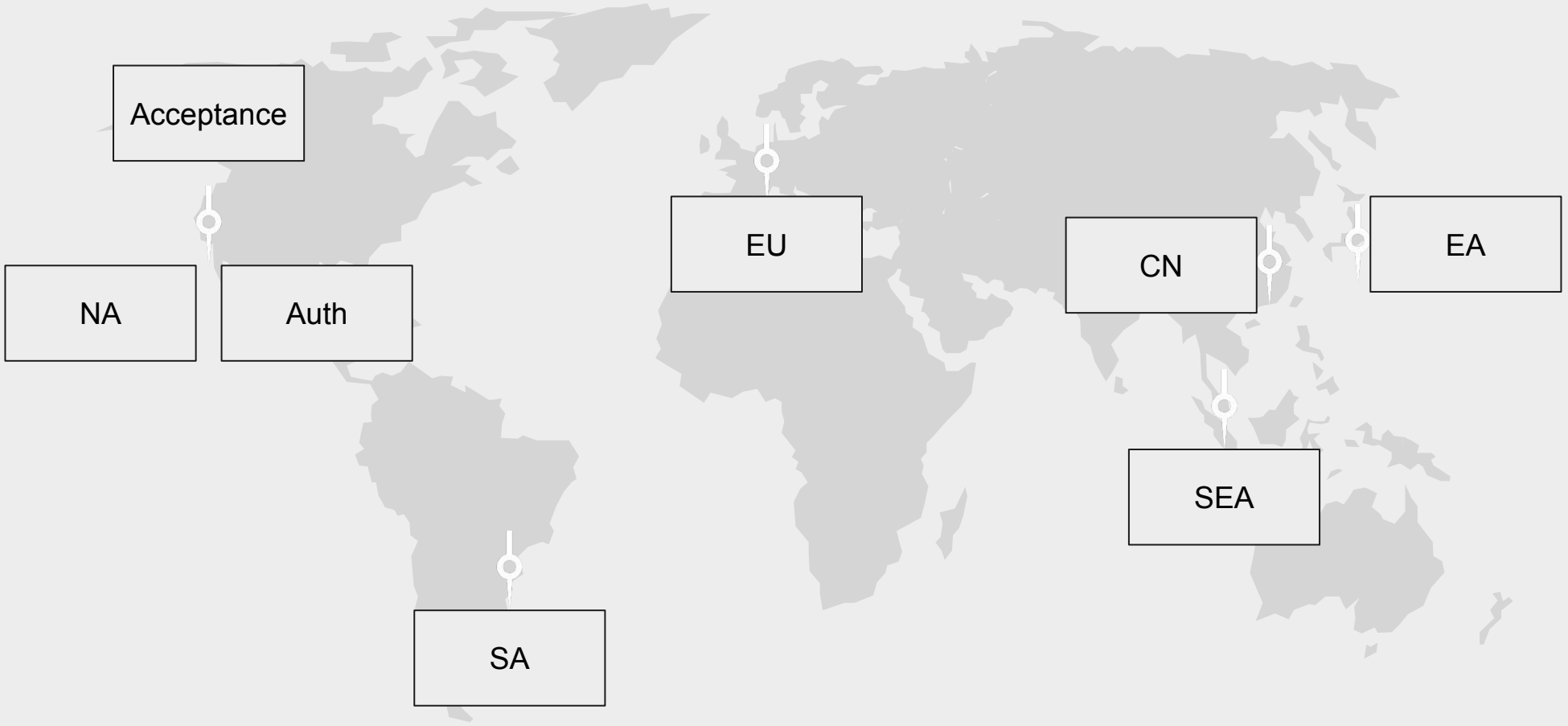
Copy/Paste These
When Applicable

PINS!

Copy/Paste These
When Applicable



PINS!

Copy/Paste These
When Applicable

Legacy Architecture