

Service Starts Suck

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Beware the Black Swan

& Phone services for SMBs

The Business

- ⌘ Phone services for SMBs
- ⌘ *Hosted* Phone services for SMBs

The Business

- ⌘ Phone services for SMBs
- ⌘ *Hosted* Phone services for SMBs
- ⌘ *Hosted Cloud Communications* service for SMBs

The Business

- ⌘ Phone services for SMBs
- ⌘ *Hosted* Phone services for SMBs
- ⌘ *Hosted Cloud Communications* service for SMBs

The Business



MTCE

TONE: CLOCK

1

EXPW INTFC

2

EXPW INTFC

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

POWER UNIT

POWER UNIT

POWER UNIT

POWER SUPPLY





vmware®



The Metrics

& Phone Calls per Second

The Metrics

& Phone Calls per Second

x 1000

The Metrics

& Simultaneous Phone Calls

The Metrics

& Simultaneous Phone Calls

x 10,000

The Metrics

& HTTP API requests

The Metrics

& HTTP API requests



The Metrics

& Big pipes

The Infrastructure

- ⌘ Big pipes
- ⌘ Polyglot (Erlang, Java, Ruby, Perl,...)

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- ⌘ Loosely Coupled Systems
- ⌘ Multi-site / Multi-cluster

The Infrastructure



My Vacation



(Actually, the day before)



A small failure...



85675867	0023555460	12544122321	24685675867	0023555460	12545022321	24685675867	0023555460	125451022
52768597	02605554864	22301123254	56452768597	02605554864	22301123254	56452768597	02605554864	22301123
97546567	52107905648	89780158595	45197546567	52107905648	89780158595	45197546567	52107905648	89780158
66666666	9201.265340	46243801255	67666666666	9201.265340	46243801255	67666666666	9201.265340	46243801
65468597	5326498235.	56897845022	66665468597	5326498235.	56897845022	66665468597	5326498235.	56897845
21342430	03125643754	24584686530	52421342430	03125643754	24584686530	52421342430	03125643754	24584686
29752834	34201326497	44565752389	43529752834	34201326497	44565752389	43529752834	34201326497	44565752
56749758	88260214687	70122648654	01356749758	88260214687	70122648654	01356749758	88260214687	7012264
01326798	95462032156	89901245984	53701326798	95462032156	89901245984	53701326798	95462032156	89901245
60546412	87546200012	56578021657	78760546412	87546200012	56578021657	78760546412	87546200012	56578021
01352679	56489854222	89535670000	56701352679	56489854222	89535670000	56701352679	56489854222	89535670
524.2134	30215021569	01444587901	886524.2134	30215021569	01444587901	886524.2134	30215021569	01444587
54240404	87459823654	89564875564	54654240404	87459823654	89564875564	54654240404	87459823654	89564875
21404359	85123030213	02654895465	23421404359	85123030213	02654895465	23421404359	85123030213	02654895
53402213	13311123150	13025165465	78553402213	13311000011	13025165465	78553402213	13311125644	13025165
58672464	25468952654	76540215497	49758672464	25468952654	76540215497	49758672464	25468952654	76540215
68652031	78021328503	87654860216	97968652031	78021328503	87654860216	97968652031	78021328503	87654860
79561203	57920045685	54897564202	25679561203	57920045685	54897564202	25679561203	57920045685	54897564
56530979	48314904153	15465465460	26456530979	48314904153	15465465460	26456530979	48314904153	15465465
32031246	18946516746	2165421565	86532031246	18946516746	21654621565	86532031246	18946516746	21654621
56452123	51561687515	402165616	561687515	51561687515	402165462123	51561687515	40216548	56452123
45754545	23162685421	561021626	23162685421	56102165	23162685421	56102165	23162685421	56102165
91675425	62964975421	6216554052	76501675425	62964975421	621655054052	76501675425	62964975421	62165054
59782135	35656497652	13245450154	34659782135	35656497652	13245450154	34659782135	35656497652	13245450
23100002	31200124556	84987984301	64023100002	31200124556	84987984301	64023100002	31200124556	84987984
56462857	87976423120	24568765435	13656462857	87976423120	24568765435	13656462857	87976423120	24568765
45622256	31655976421	01235435435	55645622256	31655976421	01235435435	55645622256	31655976421	01235435
66566433	05234605242	43021648576	79866566433	05234605242	43021648576	79866566433	05234605242	43021648
23101346	59257561221	53441100000	59823101346	59257561221	53441100000	59823101346	59257561221	53441100
57242104	56024565237	00000001243	56457242104	56024565237	00000001243	56457242104	56024565237	00000001
68976543	85421245454	53727672034	23168976543	85421245454	53727672034	23168976543	85421245454	53727672
12124567	45156402124	2537576320	24212124567	45156402124	2537576320	24212124567	45156402124	25375763
12054976	24575454012	43597572	54212054976	24575454012	43597572	54212054976	24575454012	43597572
23051564	42245454440	40133727967	85323051564	42245454440	40133727967	85323051564	42245454440	40133727
46791630	55546520303	97801322479	65246791630	55546520303	97801322479	65246791630	55546520303	97801322
52675642	40555120245	69675014372	21352675642	40555120245	69675014372	21352675642	40555120245	69675014
21000231	21205512563	97846520434	13421000231	21205512563	97846520434	13421000231	21205512563	97846520
00000005	23564012452	52768975403	24000000005	23564012452	52768975403	24000000005	23564012452	52768975
24242412	54545450215	24214672732	42424242412	54545450215	24214672732	42424242412	54545450215	24214672
52424524	88879564501	03427679854	75452424524	88879564501	03427679854	75452424524	88879564501	03427679
01243424	55556523154	64031254596	97501243424	55556523154	64031254596	97501243424	55556523154	64031254

SYSTEM FAILURE

The Horror! The Horror!

- ⌘ Big pipes
- ⌘ Polyglot (Erlang, Java, Ruby, Perl,...)
- ⌘ Loosely Coupled Systems
- ⌘ Multi-site / Multi-cluster

The Infrastructure

- & Big pipes
- & Polyglot (Erlang, Java, Ruby, Perl,...)
- & **Loosely Coupled Systems**
- & Multi-site / Multi-cluster

The Infrastructure



Why are my calls failing?



You better call me back!



I'm still p***ed off!

A woman with dark hair, wearing a dark business suit, is shown from the chest up. She is holding a white corded telephone receiver to her ear with her left hand. Her right hand is raised to her forehead, with her index finger pointing upwards, suggesting a gesture of exasperation or frustration. Her facial expression is one of annoyance, with her mouth slightly open as if she is speaking or shouting. The background is dark and out of focus, with some blue and yellow light sources visible. The overall lighting is dramatic, with strong highlights on her face and hand.

And you're stupid Apps
don't work!

85675867	0023555460	12544122321	24685675867	0023555460	12545022321	24685675867	0023555460	125451022
52768597	02605554864	22301123254	56452768597	02605554864	22301123254	56452768597	02605554864	22301123
97546567	52107905648	89780158595	45197546567	52107905648	89780158595	45197546567	52107905648	89780158
66666666	9201.265340	46243801255	67666666666	9201.265340	46243801255	67666666666	9201.265340	46243801
65468597	5326498235.	56897845022	66665468597	5326498235.	56897845022	66665468597	5326498235.	56897845
21342430	03125643754	24584686530	52421342430	03125643754	24584686530	52421342430	03125643754	24584686
29752834	34201326497	44565752389	43529752834	34201326497	44565752389	43529752834	34201326497	44565752
56749758	88260214687	70122648654	01356749758	88260214687	70122648654	01356749758	88260214687	7012264
01326798	95462032156	89901245984	53701326798	95462032156	89901245984	53701326798	95462032156	89901245
60546412	87546200012	56578021657	78760546412	87546200012	56578021657	78760546412	87546200012	56578021
01352679	56489854222	89535670000	56701352679	56489854222	89535670000	56701352679	56489854222	89535670
524.2134	30215021569	01444587901	886524.2134	30215021569	01444587901	886524.2134	30215021569	01444587
54240404	87459823654	89564875564	54654240404	87459823654	89564875564	54654240404	87459823654	89564875
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53402213	13311123150	13025165465	78553402213	13311000011	13025165465	78553402213	13311125644	13025165
58672464	25468952654	76540215497	49758672464	25468952654	76540215497	49758672464	25468952654	76540215
68652031	78021328503	87654860216	97968652031	78021328503	87654860216	97968652031	78021328503	87654860
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56452123	51561687515	402165616	561687515	51561687515	402165462123	51561687515	40216548	56452123
45754545	23162685421	561021626	23162685421	56102165	23162685421	56102165	23162685421	56102165
91675425	62964975421	6216554052	76501675425	62964975421	621655054052	76501675425	62964975421	62165054
59782135	35656497652	13245450154	34659782135	35656497652	13245450154	34659782135	35656497652	13245450
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56462857	87976423120	24568765435	13656462857	87976423120	24568765435	13656462857	87976423120	24568765
45622256	31655976421	01235435435	55645622256	31655976421	01235435435	55645622256	31655976421	01235435
66566433	05234605242	43021648576	79866566433	05234605242	43021648576	79866566433	05234605242	43021648
23101346	59257561221	53441100000	59823101346	59257561221	53441100000	59823101346	59257561221	53441100
57242104	56024565237	00000001243	56457242104	56024565237	00000001243	56457242104	56024565237	00000001
68976543	85421245454	53727672034	23168976543	85421245454	53727672034	23168976543	85421245454	53727672
12124567	45156402124	2537576320	24212124567	45156402124	2537576320	24212124567	45156402124	25375763
12054976	24575454012	43597572	54212054976	24575454012	43597572	54212054976	24575454012	43597572
23051564	42245454440	40133727967	85323051564	42245454440	40133727967	85323051564	42245454440	40133727
46791630	55546520303	97801322479	65246791630	55546520303	97801322479	65246791630	55546520303	97801322
52675642	40555120245	69675014372	21352675642	40555120245	69675014372	21352675642	40555120245	69675014
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24242412	54545450215	24214672732	42424242412	54545450215	24214672732	42424242412	54545450215	24214672
52424524	88879564501	03427679854	75452424524	88879564501	03427679854	75452424524	88879564501	03427679
01243424	55556523154	64031254596	97501243424	55556523154	64031254596	97501243424	55556523154	64031254

SYSTEM FAILURE

The Horror! The Horror!

Surely you Tested?



1000 year floods

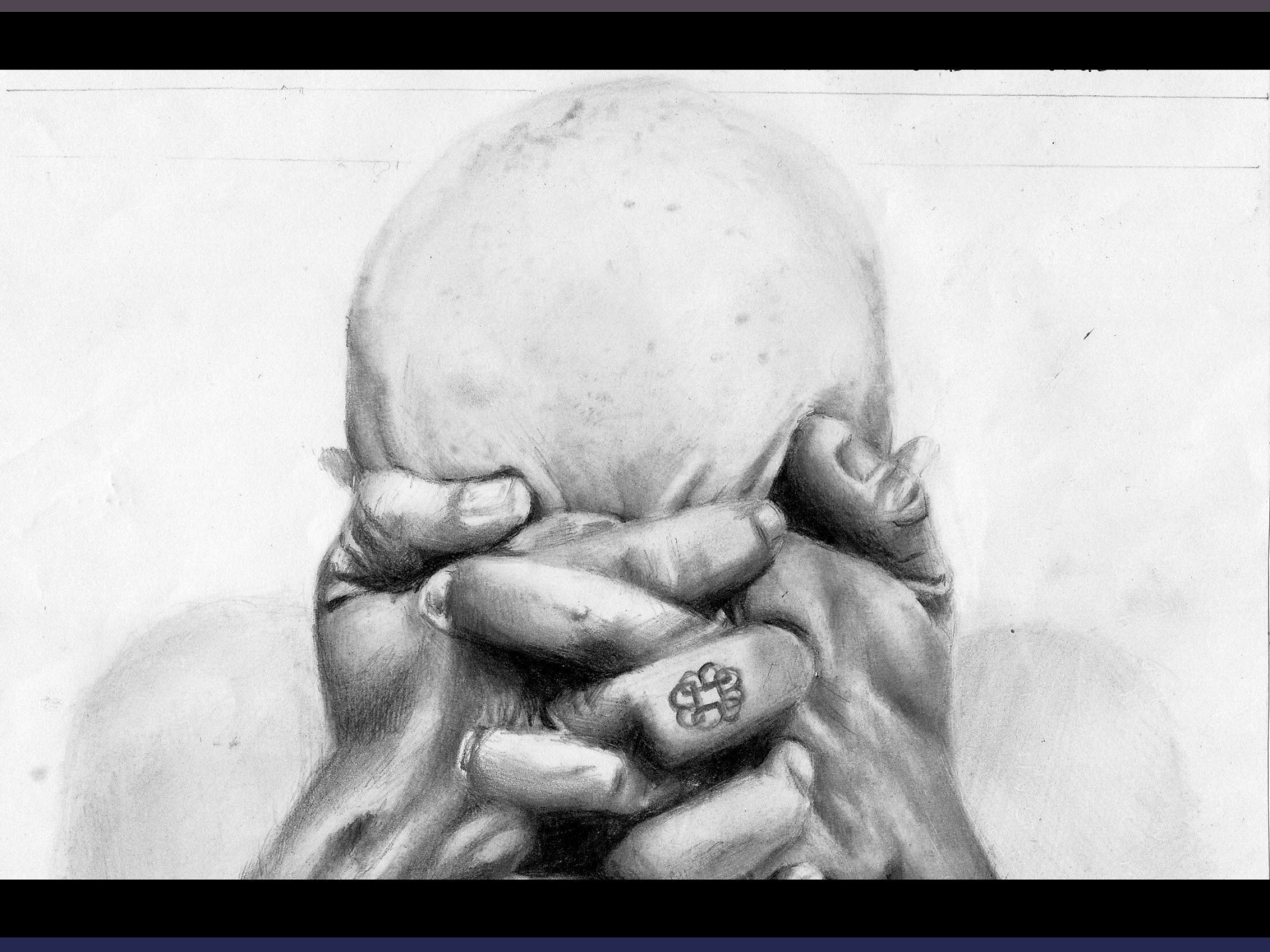


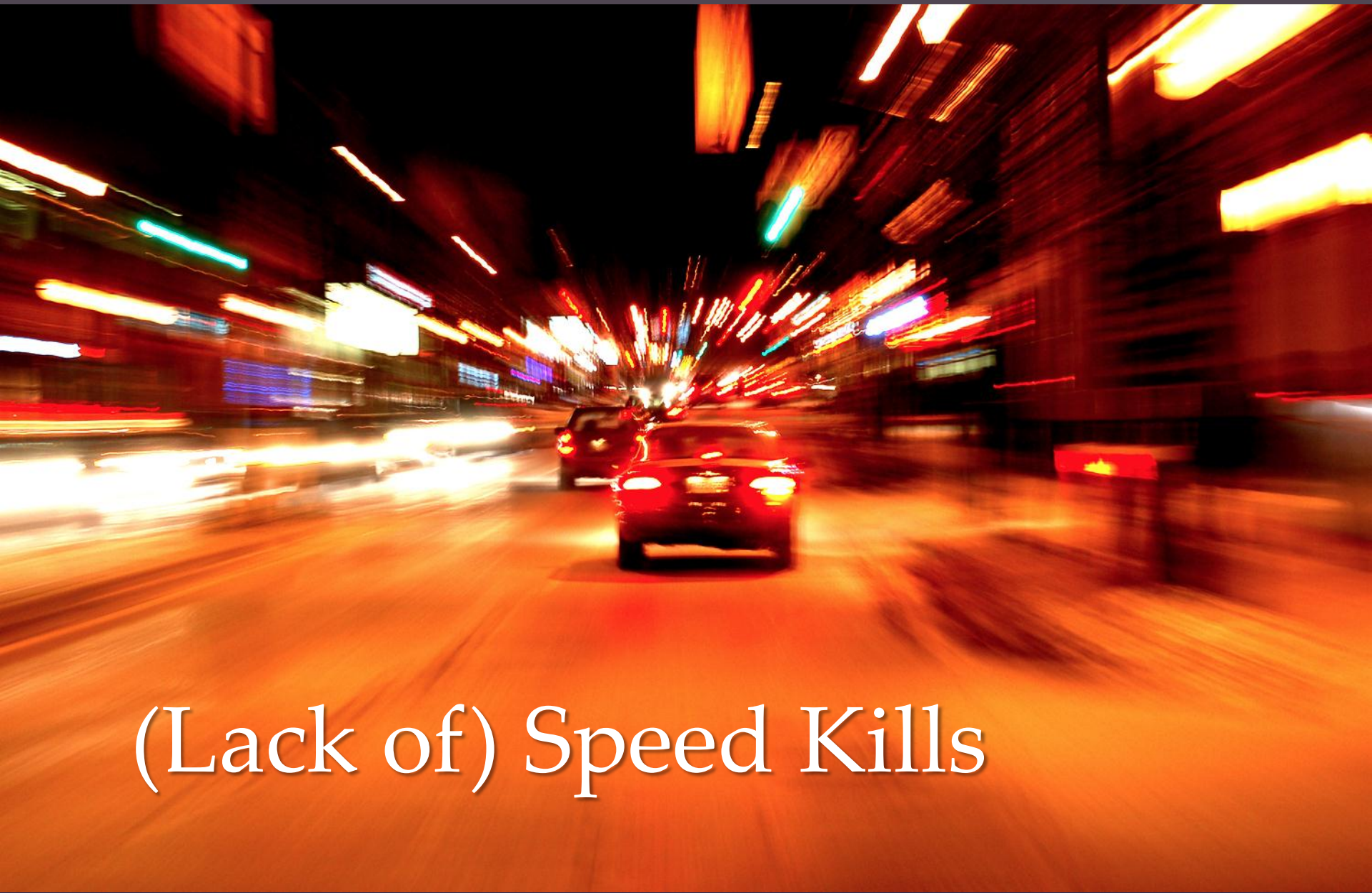


Barack Obama
For
President
2008



Romney 2012



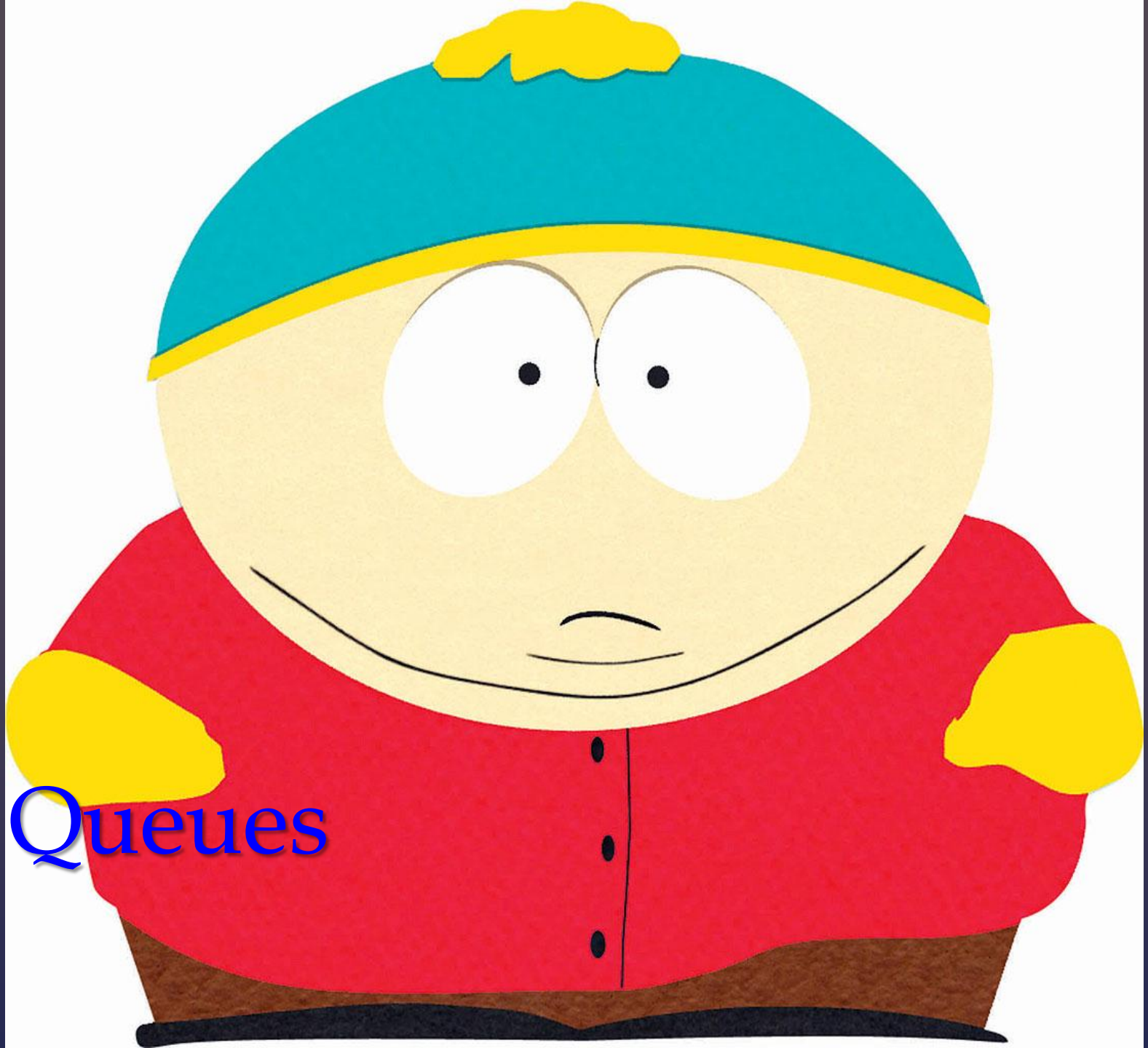


(Lack of) Speed Kills

Queues

A long-exposure photograph of a busy city street at night. The image is characterized by significant motion blur, creating vibrant light trails from the headlights and taillights of cars moving through the frame. The surrounding buildings and streetlights also exhibit horizontal streaks, contributing to a sense of rapid movement and urban energy. The color palette is dominated by warm oranges and yellows from the streetlights, contrasted with cooler blues and greens from some of the building signage.

Queues



Queues



西2

西2ホール
West Hall 2
西2号厅 / 西2番

Queues



Queues

- ⌘ Can you recover quickly?
- ⌘ Buffer-bloat doesn't matter, right?
- ⌘ Once up, can you deal with the backlog?
- ⌘ Back-pressure isn't an issue, right?

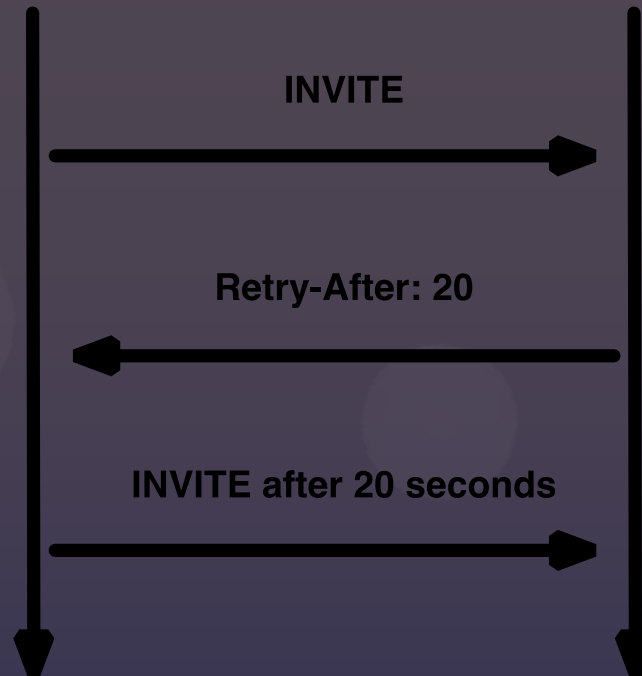
Queues

- & Can you recover quickly?
- & Buffer-bloat doesn't matter, right?
- & Once up, can you deal with the backlog?
- & Back-pressure isn't an issue, right?

Queues

SIP CLIENT

SIP SERVER



Programmable



Please wait.
We're processing your order request...



Behavioral



Self Managed



Self Managed





Queue Mgmt.

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DEPARTURE	CARRIER - FLIGHT- PARTNER			GATE	TIME	STATUS
Detroit	 UNITED	UA 7982	US 7914	A2	4:45P	Now 6:25P
Detroit	 DELTA	DL 4089		B72	7:20P	On Time
Frankfurt	 UNITED	UA 916	LH 9051		5:15P	Canceled
Frankfurt	 Lufthansa	LH 419	UA 8826	B49	5:45P	Canceled
Frankfurt	 Lufthansa	LH 419.	UA 8826	B51	5:45P	Canceled
Frankfurt	 UNITED	UA 952	QR 5798		6:53P	Canceled
Geneva	 UNITED	UA 974	AC 5960		5:46P	Canceled
Greenville	 UNITED	UA 7185	QR 5661	A6	5:05P	Departed
Harrisburg PA	 UNITED	UA 7952	BD 4400	A4	5:05P	Now 6:24P
Hartford-BDL	 UNITED	UA 312	LH 9076	D23	5:15P	Boarding
Houston	 UNITED	UA 7595	US 7667	D6	5:18P	Boarding
Indianapolis	 SOUTHWEST	WN 913		B48	7:25P	Now 7:30P
Jeddah	 SOUTH AFRICAN	SA 208	UA 9818	A14	5:40P	On Time
Johannesburg	 UNITED	UA 7821		A5	5:27P	On Time
Johnstown, PA	 DELTA	DL 6119				On Time
Kansas City						

Active Queue Mgmt.





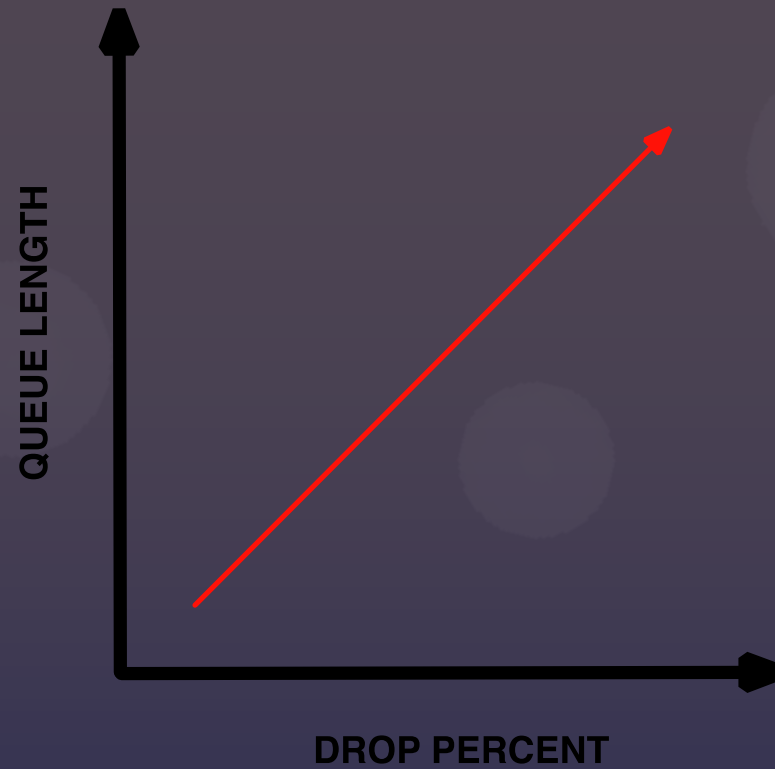
Tail Drop

A black and white portrait of a middle-aged man with dark hair, looking directly at the camera. He is wearing a striped shirt. The image is framed by dark vertical bars on the left and right sides.

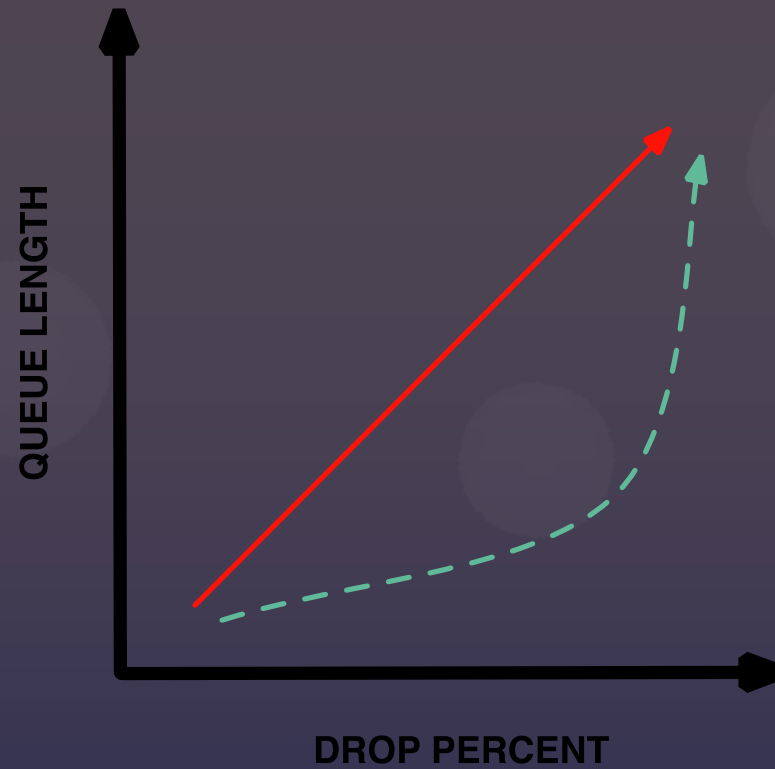
God

(category – TCP/IP)

RED

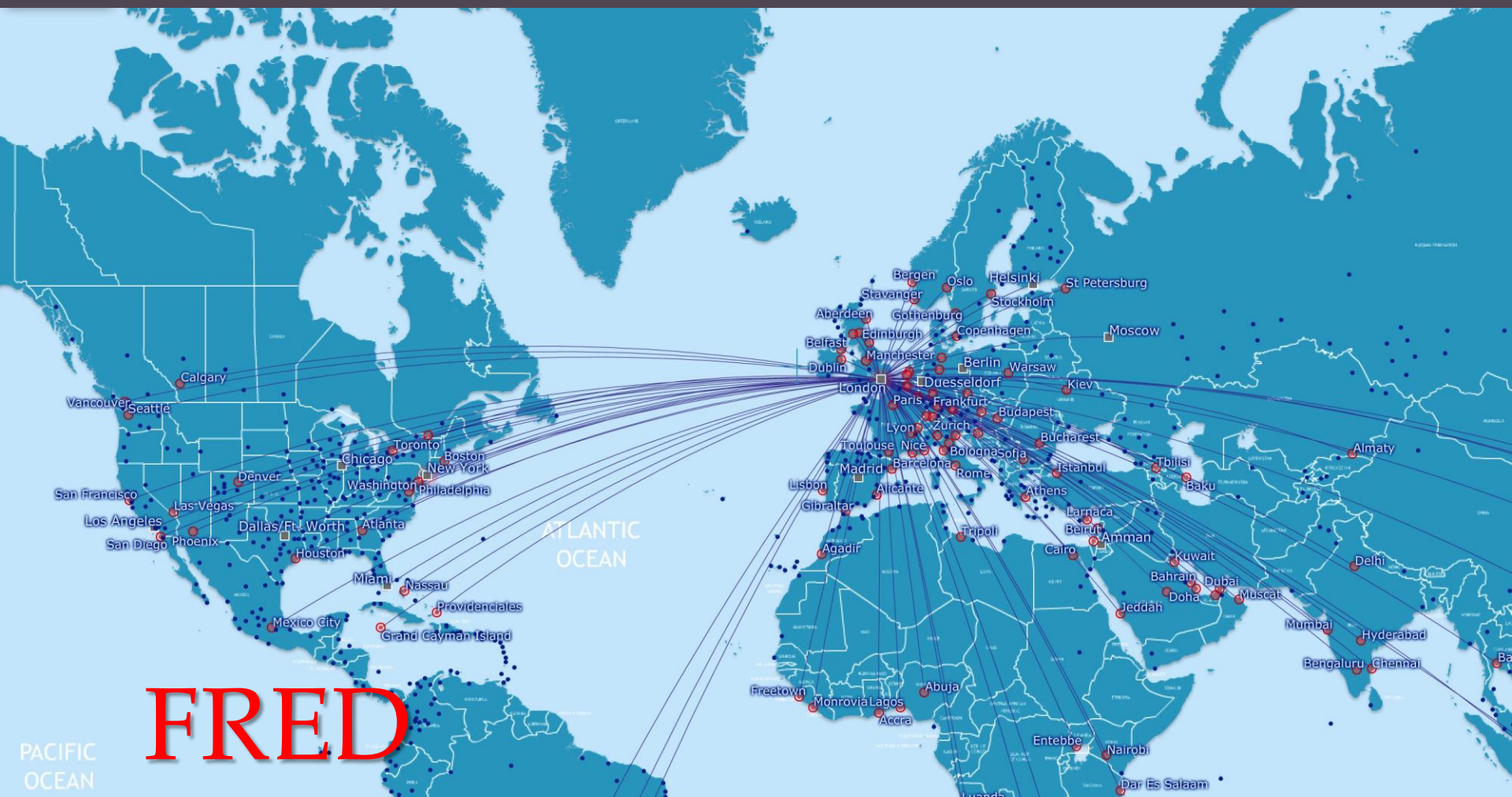


RED





Newark Airport







- & SRED
- & RRED
- & ARED (and Blue!)
- & CHOKe

RED – Many many more

& CoDel

Special Mention

What about Testing?



What about Testing?

& Black swans will occur. Oh Yes

Bottom Line

- ⌘ Black swans will occur. Oh Yes
- ⌘ You can only improve what you control

Bottom Line

- ⌘ Black swans will occur. Oh Yes
- ⌘ You can only improve what you control
- ⌘ Your business will define your discards

Bottom Line

- ⌘ Black swans will occur. Oh Yes
- ⌘ You can only improve what you control
- ⌘ Your business will define your discards
- ⌘ Agility is (always) your friend

Bottom Line



You, apparently, forgot
about me

& Free calling

The Fix



- & Free calling
- & No VM

The Fix



- & Free calling
- & No VM
- & No reporting

The Fix



- & Free calling
- & No VM
- & No reporting
- & Reject (most) APIs

The Fix





Beware the Black Swan