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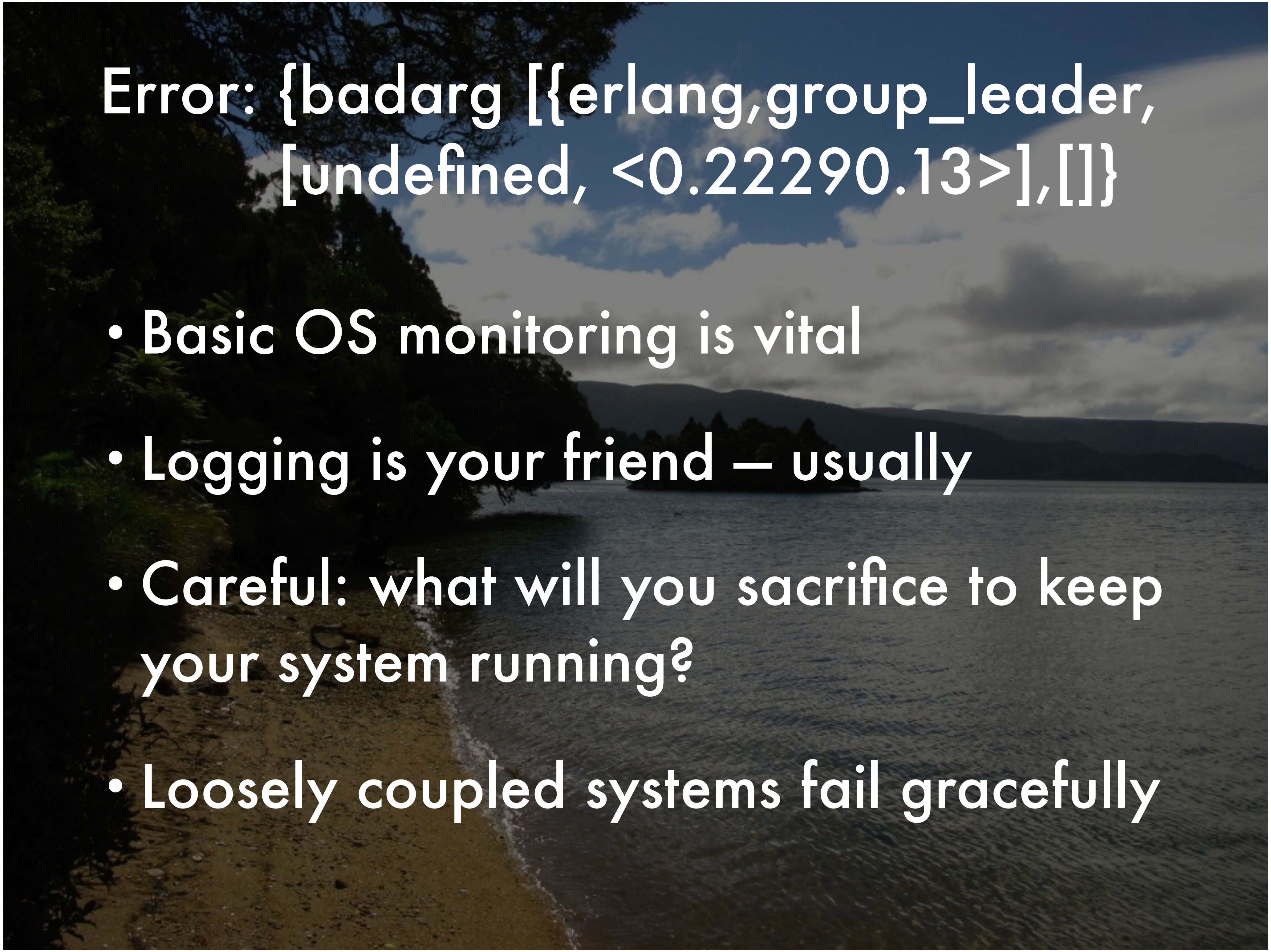
[Bringing You Artisanal Domain Names since 2007]

Fluffy
Zombie

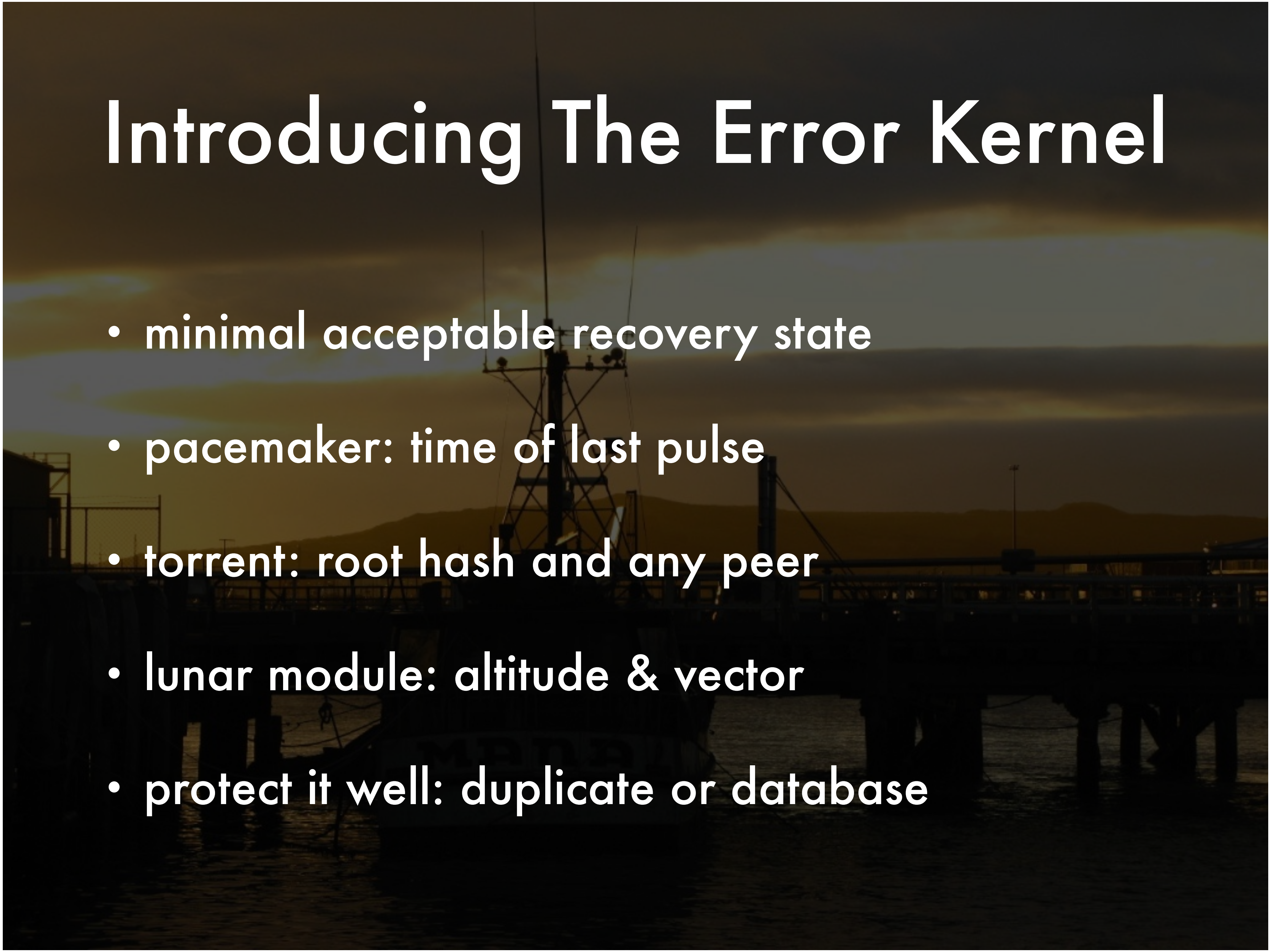


Error: {badarg [{erlang,group_leader, [undefined, <0.22290.13>],[]}

- Basic OS monitoring is vital
- Logging is your friend – usually
- Careful: what will you sacrifice to keep your system running?
- Loosely coupled systems fail gracefully

Designing OTP systems

- Error Kernels
- State Machines
- Queues & Predictable Modes of Failure
- The Happy Path – Dealing with Reality

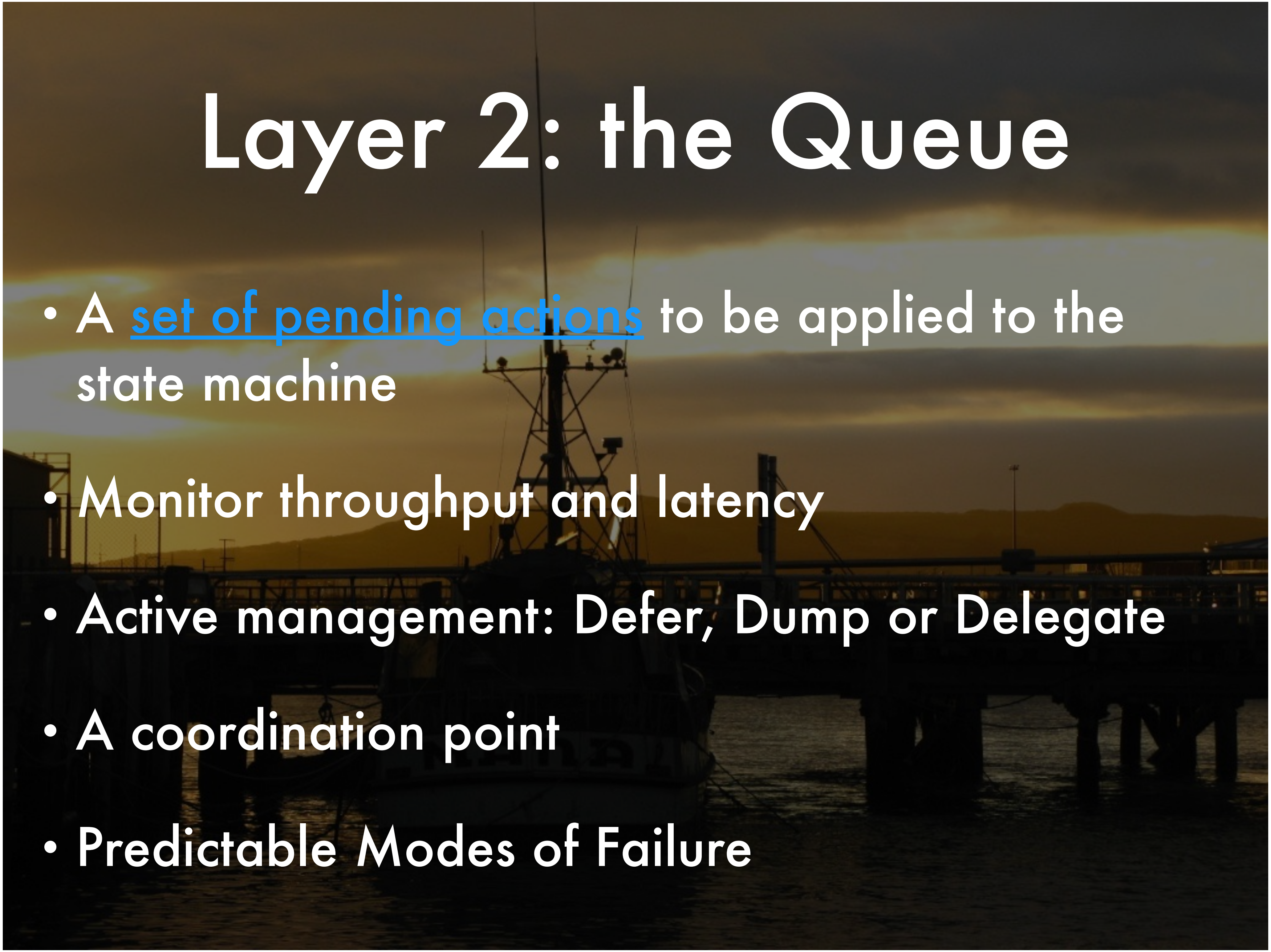


Introducing The Error Kernel

- minimal acceptable recovery state
- pacemaker: time of last pulse
- torrent: root hash and any peer
- lunar module: altitude & vector
- protect it well: duplicate or database

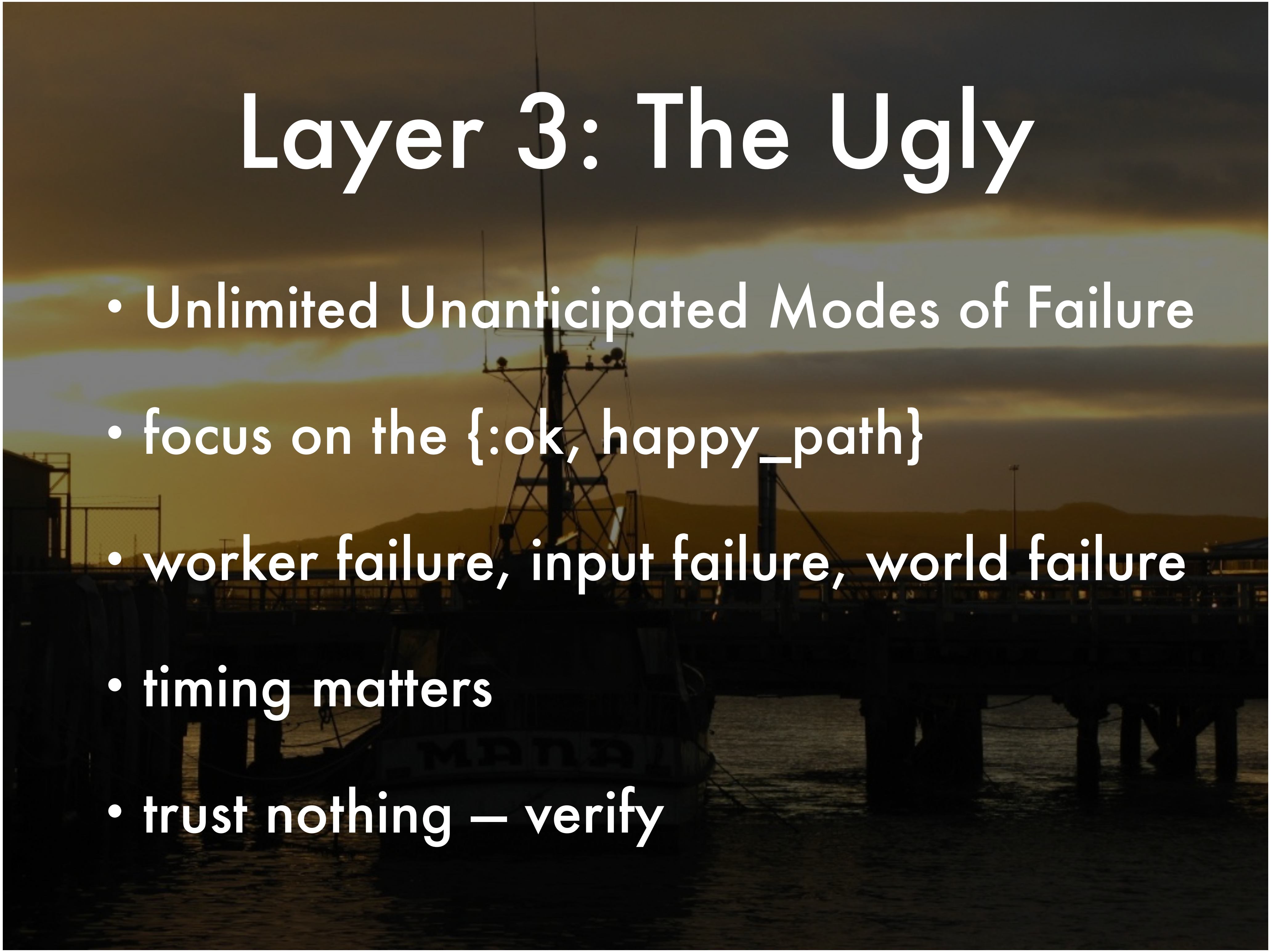
Layer 1: The Enemy is the State

- defined transitions
- validated states
- test it hard
- delegate everything else



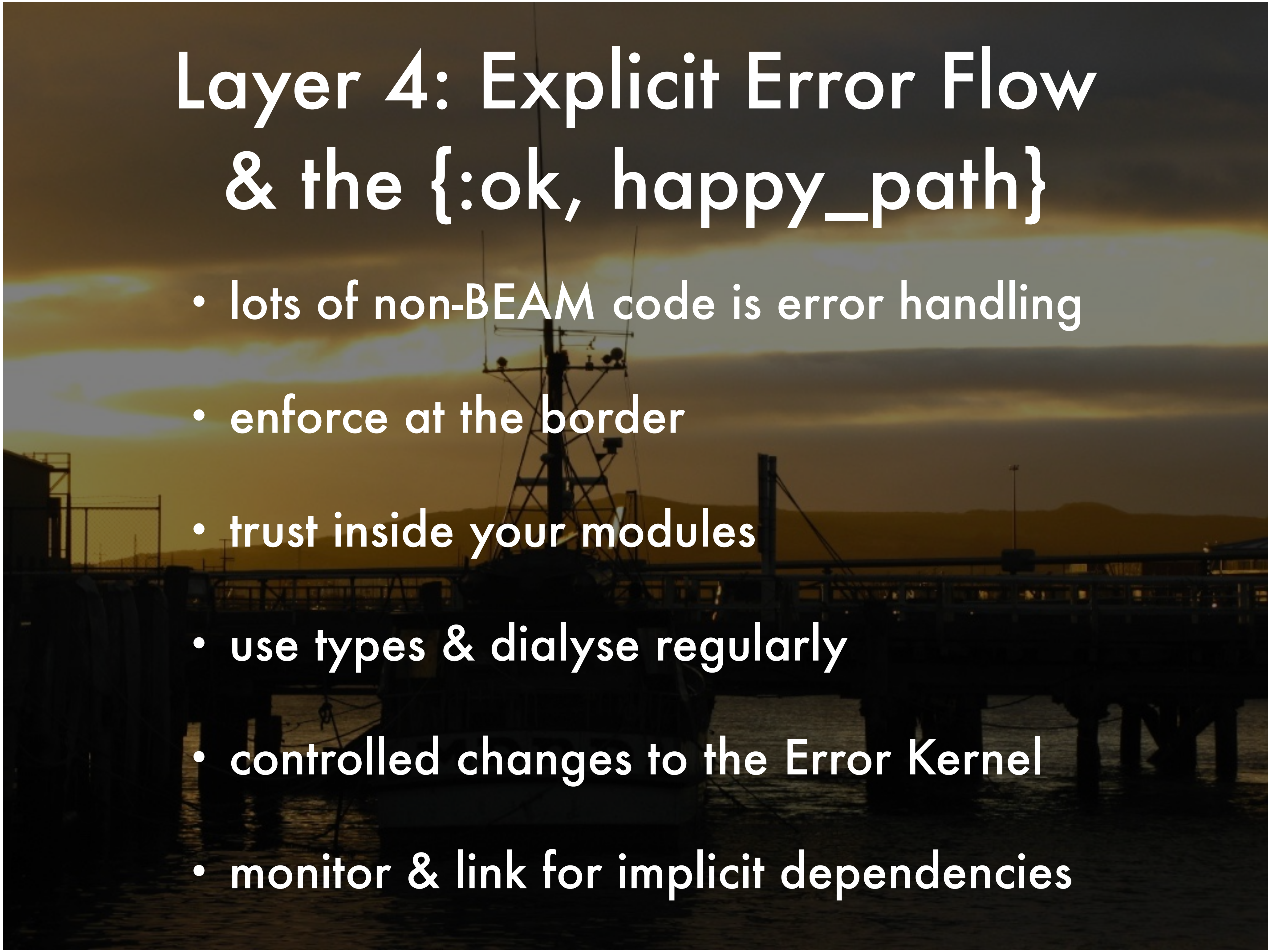
Layer 2: the Queue

- A set of pending actions to be applied to the state machine
- Monitor throughput and latency
- Active management: Defer, Dump or Delegate
- A coordination point
- Predictable Modes of Failure



Layer 3: The Ugly

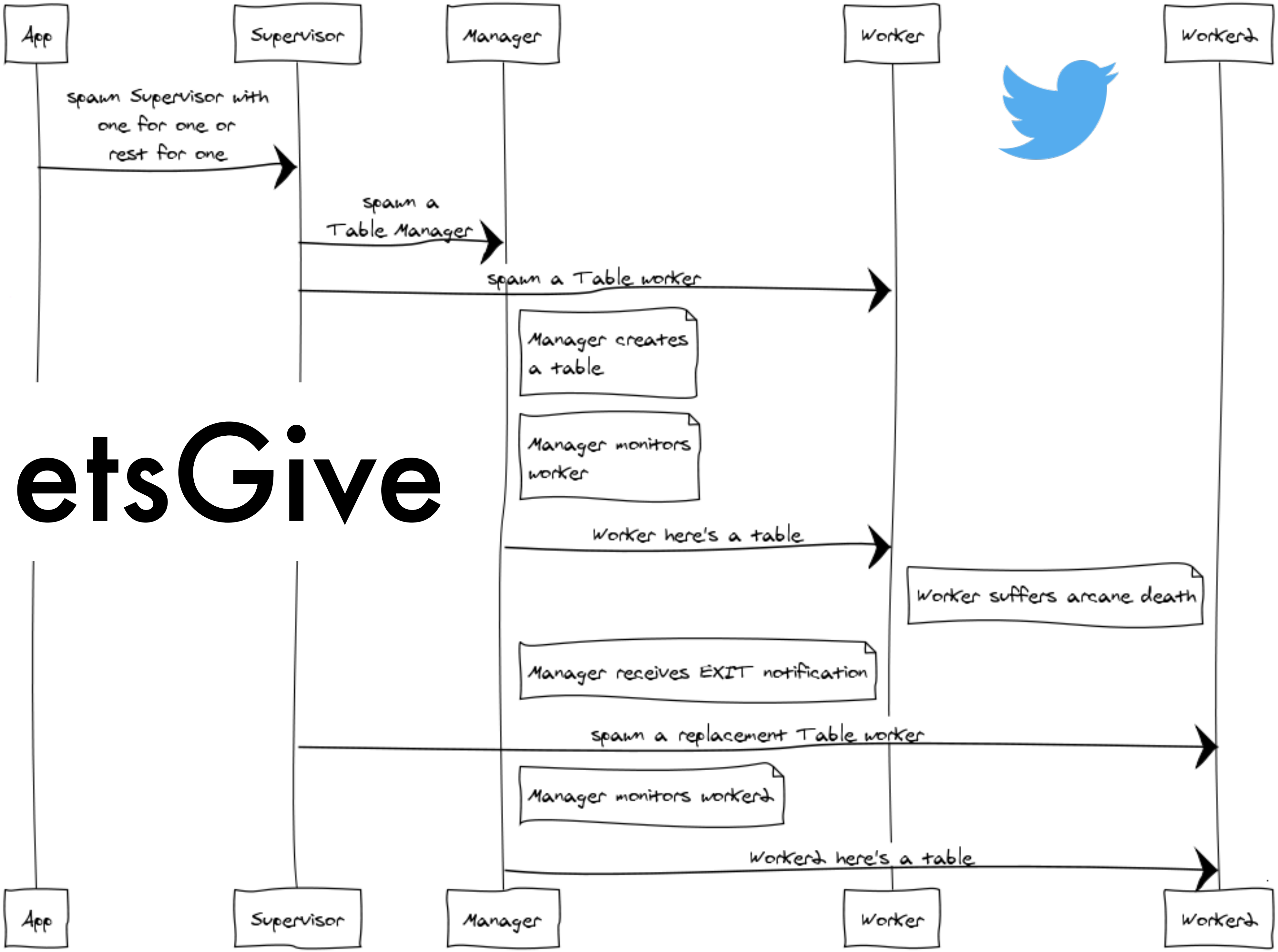
- Unlimited Unanticipated Modes of Failure
- focus on the {:ok, happy_path}
- worker failure, input failure, world failure
- timing matters
- trust nothing – verify



Layer 4: Explicit Error Flow & the {:ok, happy_path}

- lots of non-BEAM code is error handling
- enforce at the border
- trust inside your modules
- use types & dialyse regularly
- controlled changes to the Error Kernel
- monitor & link for implicit dependencies

etsGive


App
Supervisor
Manager
Worker
Worker2
spawn Supervisor with one for one or rest for one
spawn a Table Manager
spawn a Table worker
Manager creates a table
Manager monitors worker
Worker here's a table
Worker suffers arcane death
Manager receives EXIT notification
spawn a replacement Table worker
Manager monitors worker2
Worker2 here's a table
App
Supervisor
Manager
Worker
Worker2

BEAM Ops

- <3 Releases: pure BEAM== dependency free
- Hate Releases: anti-UNIX != logging, SIG*
- Logging: jury still out
- Monitoring: do both
  - White box: event your code
  - Black box: look from the OS & network in
- Live debugging

summary × couch rabbit +

disk

	df-root/df_complex-free
ace.iwm	47376654336
bill.dl	128884895744
calvin.iwm	54774116352
ellis.dl	156034396160
jano.has	53949403136
lanc	2233802752
lara.searcl	55182368768
roger.n	15159906304
sheba.has	53970595840

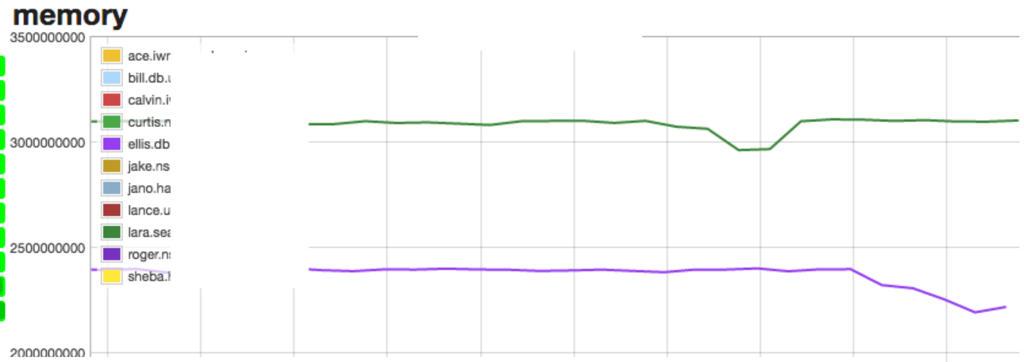
tunnels

	ace	bill.	calvin.	ellis.d
curl-couchdb/response_code	200	200	200	200
curl-couchdb/response_time	0	0	0	0
curl-couchdb_backup/response_code		200		200
curl-couchdb_backup/response_time		0.28		0.25
curl-frontend/response_code	200	200	200	200
curl-frontend/response_time	0.47	0.92	0.61	0.53
curl-kyoto/response_code	200	200	200	200
curl-kyoto/response_time	0	0	0	0
curl-kyoto_backup/response_code		200		200
curl-kyoto_backup/response_time		0.15		0.33
curl-rabbitmq/response_time	0.04	0	0.04	0

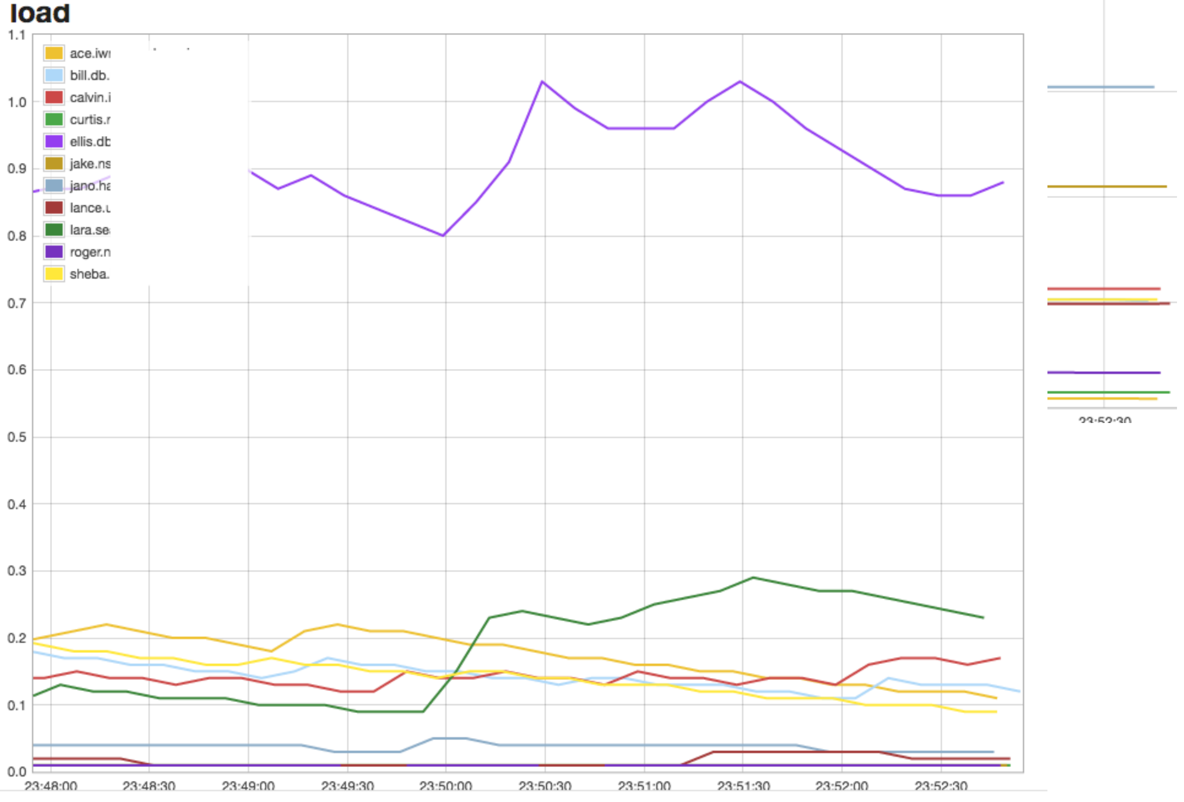
uptime

	uptime/uptime
ace.iwm	4259860
bill.d	19679043
calvin.iwm	4036536
curtis.i	7165306
ellis.d	20106763
jake.nsı	15559577
jano.has	4219282
lanc	4266274
lara.searc	8999368
roger.n	22722966
sheba.has	22799689

memory



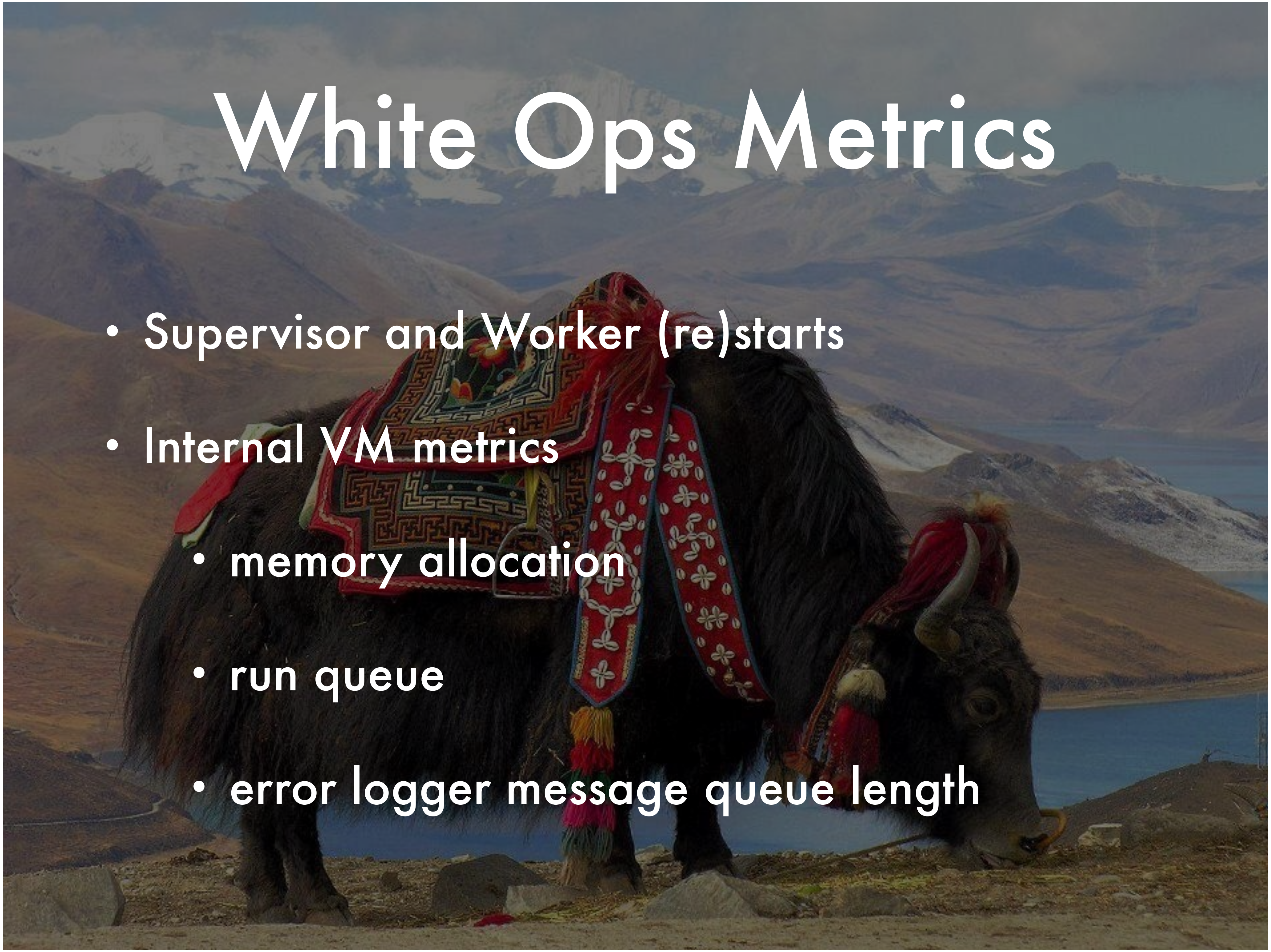
load



rabbitmq

	ellis.
rabbitmq monitoring	ok
rabbitmq.object_totals.channels	167
rabbitmq.object_totals.connections	166
rabbitmq.object_totals.consumers	264
rabbitmq.object_totals.exchanges	15
rabbitmq.object_totals.queues	172
rabbitmq.queue_totals.messages	0
rabbitmq.queue_totals.messages_details	0
rabbitmq.queue_totals.messages_ready	0
rabbitmq.queue_totals.messages_ready_details	0
rabbitmq.queue_totals.messages_unacknowledged	0
rabbitmq.queue_totals.messages_unacknowledged_details	0

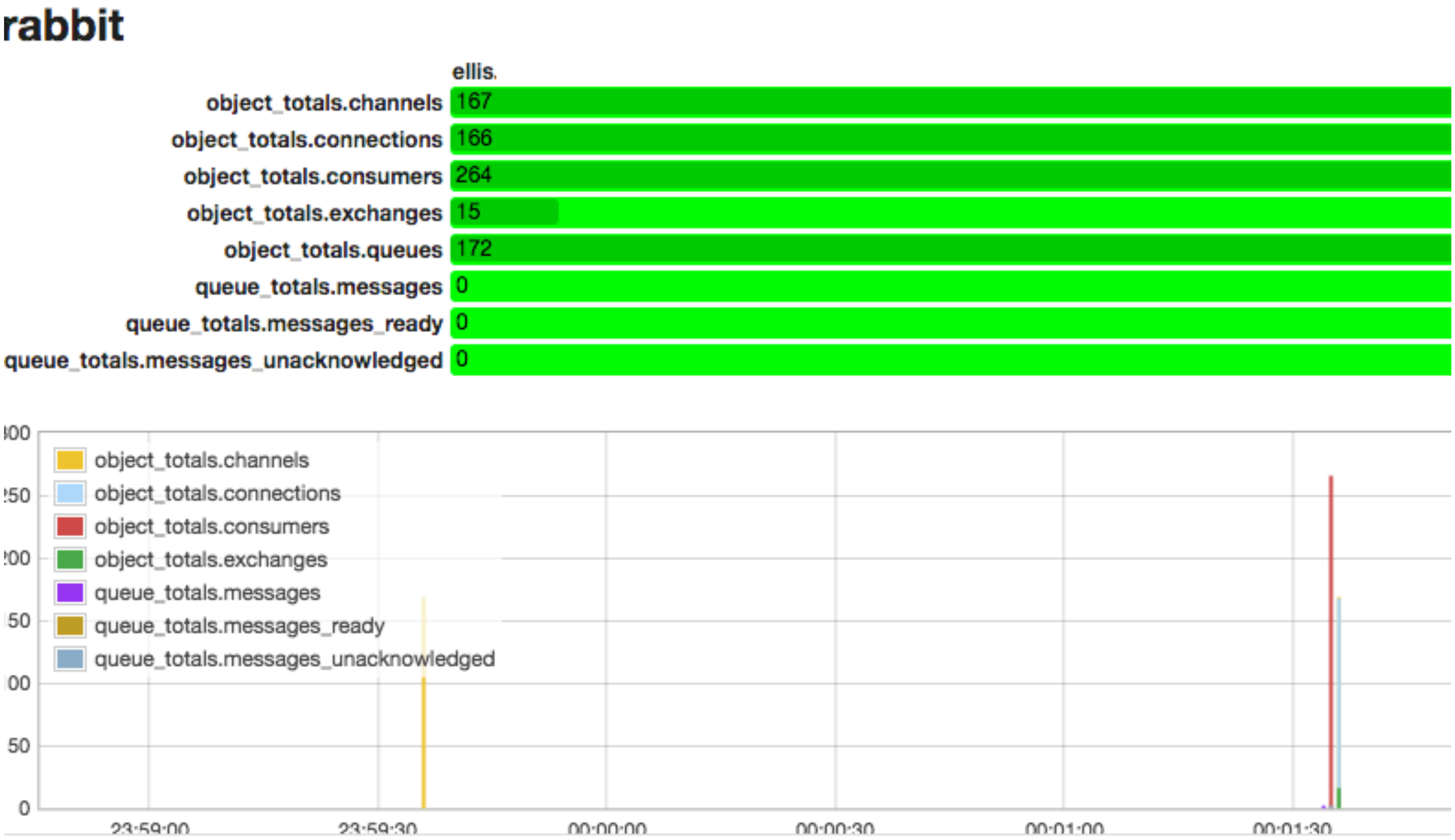
Black Box:
OS Metrics



White Ops Metrics

- Supervisor and Worker (re)starts
- Internal VM metrics
  - memory allocation
  - run queue
  - error logger message queue length

App-Specific – RabbitMQ

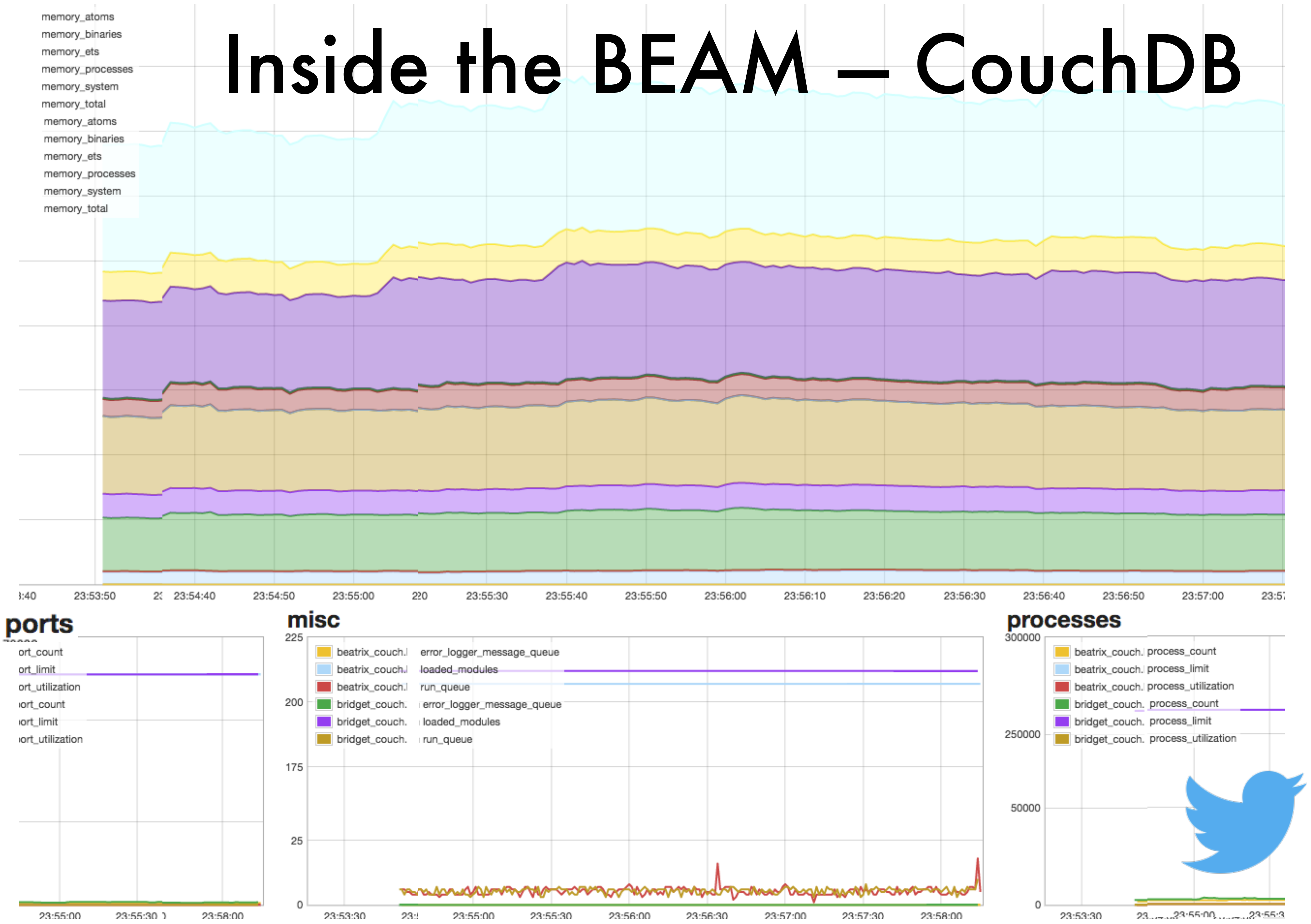


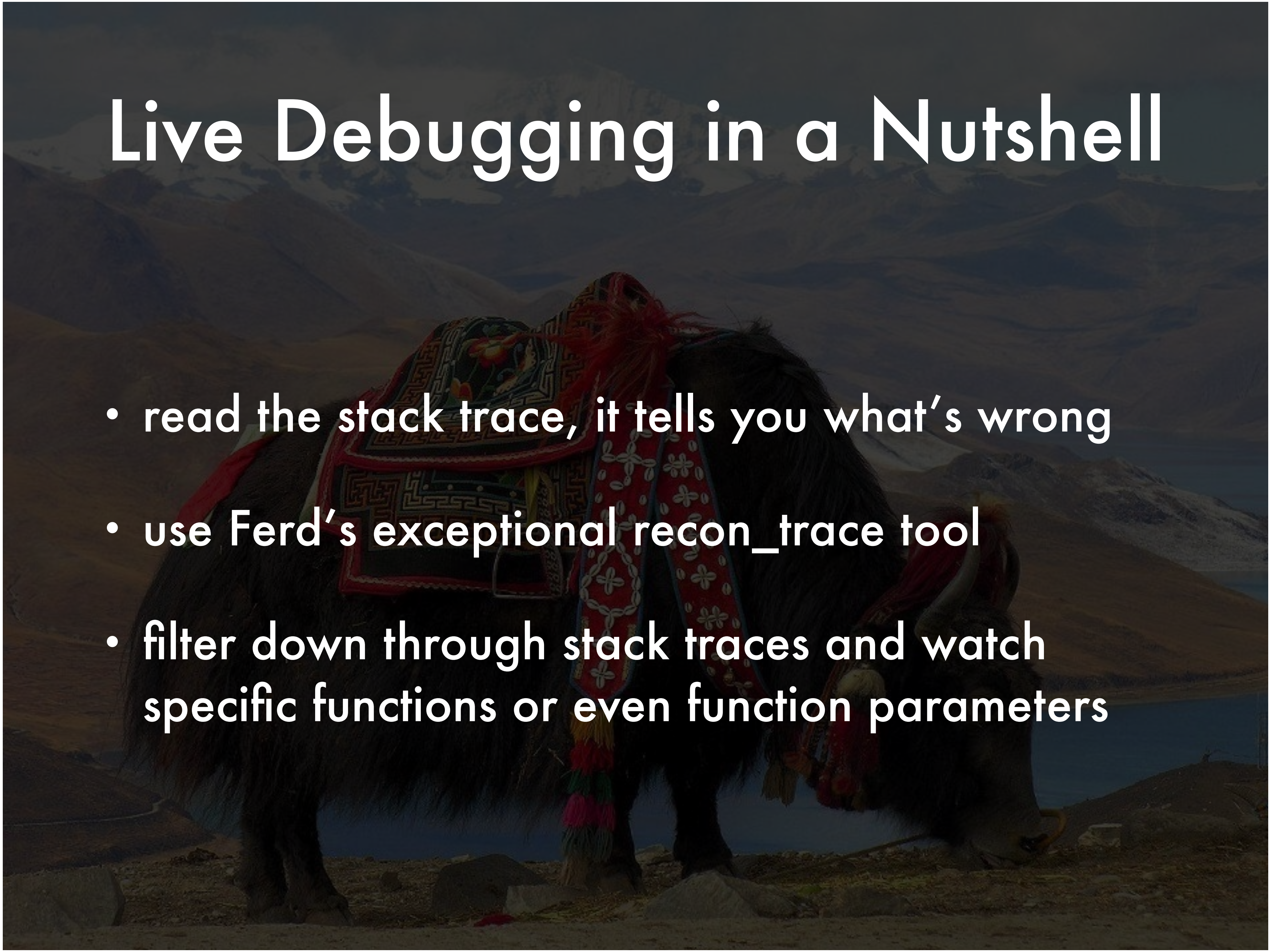
rabbit

	ellis.
object_totals.channels	167
object_totals.connections	166
object_totals.consumers	264
object_totals.exchanges	15
object_totals.queues	172
queue_totals.messages	0
queue_totals.messages_ready	0
queue_totals.messages_unacknowledged	0

00
50
00
50
00
50
0
23:59:00
23:59:30
00:00:00
00:00:30
00:01:00
00:01:30
🟨 object_totals.channels
🟦 object_totals.connections
🟥 object_totals.consumers
🟩 object_totals.exchanges
🟪 queue_totals.messages
🟫 queue_totals.messages_ready
🟦 queue_totals.messages_unacknowledged

Inside the BEAM – CouchDB





Live Debugging in a Nutshell

- read the stack trace, it tells you what's wrong
- use Ferd's exceptional recon_trace tool
- filter down through stack traces and watch specific functions or even function parameters

@dch__

https://home.apache.org/~dch

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Image Credits

- Zombie Rabbit: http://checker-bee.deviantart.com/art/Fluffy-Zombie-Bunny-325012765
- Yak: http://ideastochill.blogspot.com/2014/01/yak-animal.html
- Photos: @dch__ taken onsite in New Zealand

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