Square Bubble

Integration Monitoring and Governance Software

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@MQTC 2.0.1.7

Effective MQ Monitoring with Square Bubble, log management and machine learning

Square Bubble Web

syntegrity
innovations

Brief history

- Established 2010 by ex IBMers
- Focus on Integration & Security Consultancy
- Product specialists in IIB, MQ & DataPower

- Established 2015 by more ex IBMers
- Focus on product development

Mission statement: We enable you to keep your business running, optimise costs and improve your customer’s experience.

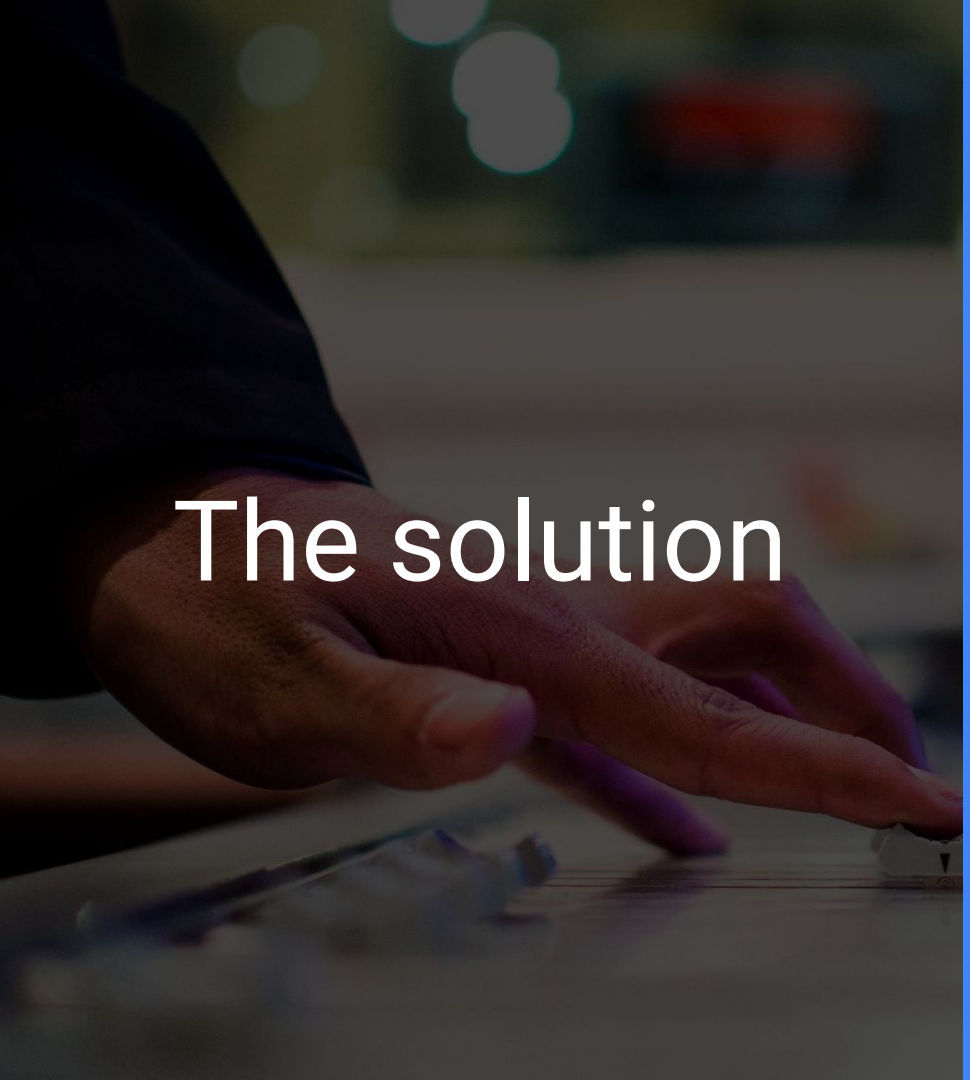
The problem

Companies rely on IT Systems with integration platforms to deliver their core, revenue earning services

Downtime affects the bottom line (Avaya study 2014: average company losing $140,003 per incident, >$500,000 in the financial sector)

Not promoting uptime can cost you up to $240,000+ (StatusCast)

Integration platforms can be difficult to manage effectively



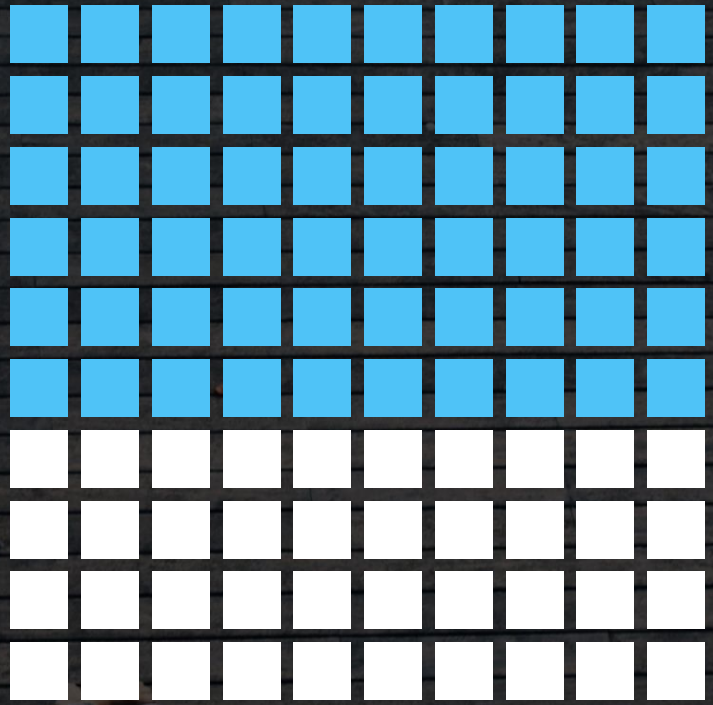
The solution

Square Bubble will provide greater visibility of the state of your integration platforms.

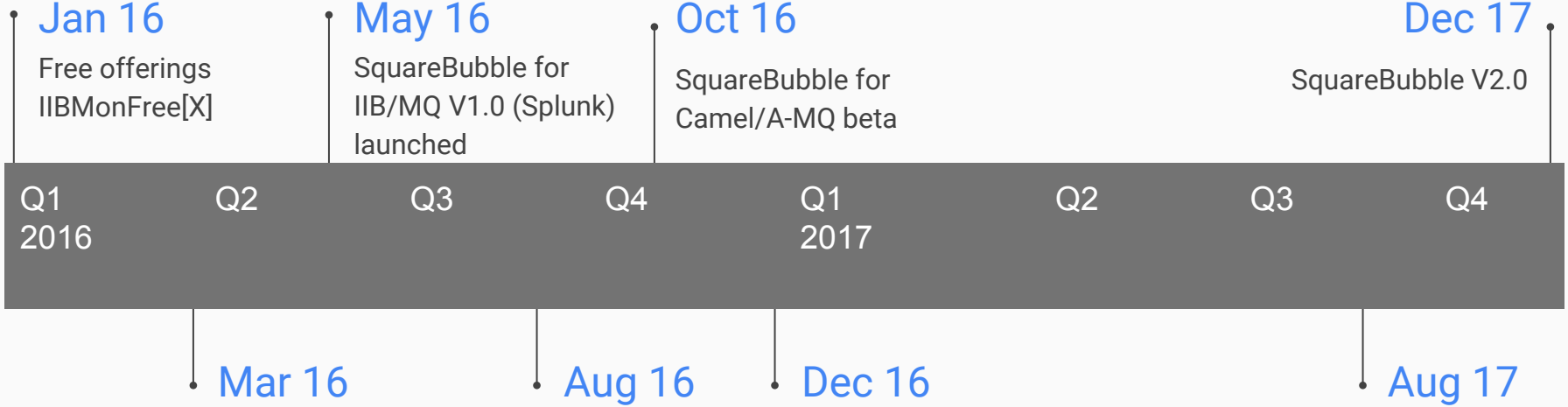
With this information, you can take control to provide a better service to your customer.

Why now?

The availability and adoption of BI and analytics tools (splunk) have revolutionised monitoring. Data can be taken from multiple sources and combined to give greater insights.



Milestones


Jan 16
Free offerings IIBMonFree[X]
May 16
SquareBubble for IIB/MQ V1.0 (Splunk) launched
Oct 16
SquareBubble for Camel/A-MQ beta
Dec 17
SquareBubble V2.0
Q1 2016
Q2
Q3
Q4
Q1 2017
Q2
Q3
Q4
Mar 16
SquareBubble for IIB/MQ beta
Aug 16
Support for MQ on z/OS and Elastic Stack V1.1
Dec 16
Support Splunk HEC V1.2
Aug 17
SquareBubble for DataPower beta

Testimonials

Andrew Seymour, Lead NPP Architect, Azuron.

- We engaged the guys at Syntegrity Innovations at a critical phase of a New Payments Platform (NPP) implementation for one of our clients. Our client is a leading financial institution and one of the few directly connected NPP Participants that meant, by necessity, the MQ and IIB environment was quite complex.
- In a very short space of time we had the Square Bubble plugin setup across the environment and feeding our Splunk instance with a myriad of useful information that helped our developers, non-functional testers and architects quickly identify performance bottlenecks in the system.

Andrew Seymour, Lead NPP Architect, Azuron. cont'd

- This was of enormous help to us in meeting our tight non-functional testing timelines.
- Square Bubble, and the IIB and MQ dashboards that come with it, continue to be used for industry reporting and performance analysis of the NPP platform that is critical to the success of our project.
- As a project, we were very fortunate to have Square Bubble deliver us so much value, so quickly and at such a critical time.

Steve Thomas, Payment Platform Technical Lead

- We use SquareBubble as a core component that collects data from our MQ and IBM IIB infra-structure. The data is invaluable in providing the BAU and third level support teams with a complete realtime and historical view of our payment system. This ensures they can remain responsive to the business and technical users, even in the face of rapidly growing traffic.
- The detailed monitoring capabilities and huge choice of dashboards have also helped us quickly diagnose a range of issues. From fixing problems with throughput or latency to monitoring the general health of the system. The next steps for us is to use the data as input into our data analytics. We definitely couldn’t support our system without the Square Bubble!

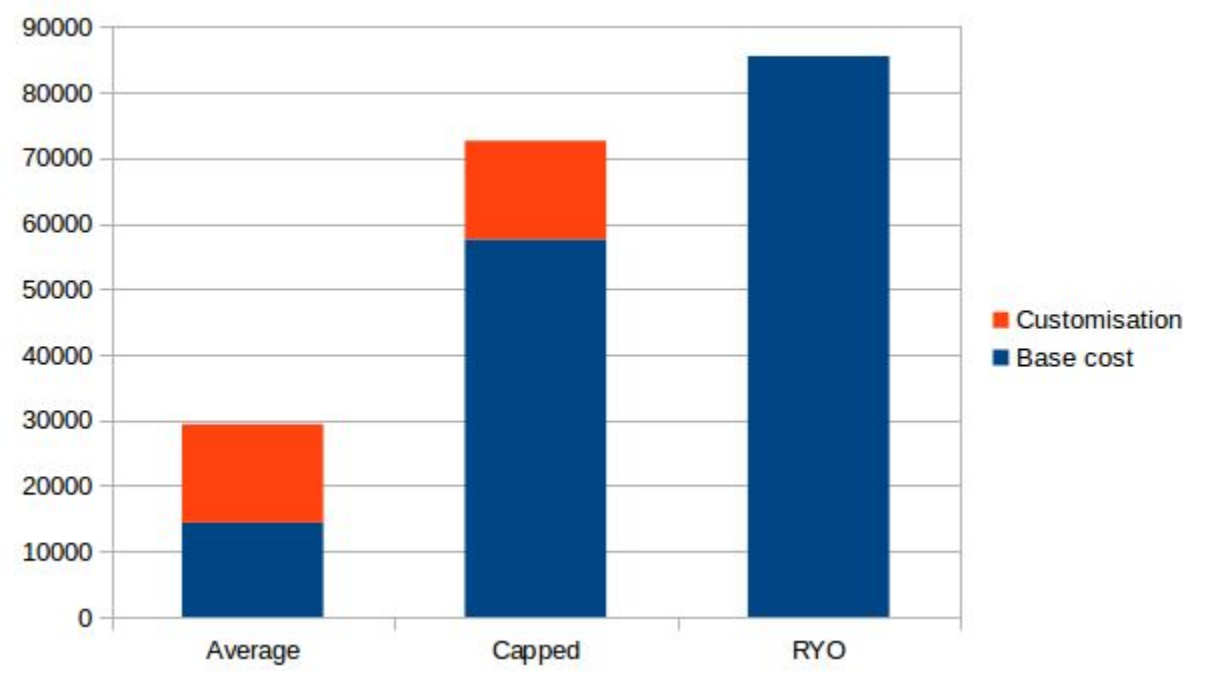
What does it cost?

License costs

Period	Cost per *Server*	Discount
1 year	$100 per month (*)	
3 years	$75 per month (*)	25%
5 years	$60 per month (*)	40%

- **(*) Taxes and handling fees may also apply**
- *Server* is a physical/virtual host/OS image, irrespective of the number of IIB or MQ Instances installed
- Capped at 16 servers (unlimited)
- Includes support, patches and minor version updates

Cost comparison



Costed options - assumes a 5 year deployment

Where can you buy it?

syntegrity innovations	From the website via paypal http://squarebubble.io
vadosity	US customers only, email sales@vadosity.com for a quote
syntegrity solutions	Australia and elsewhere, email sales@syntegrity.com.au for a quote

The technical view


The technology:
Enterprise Service Bus &
Enterprise Messaging
combined with Business
Intelligence/Analytics.

Integration Landscape

Homegrown:
- HR
- CRM
- ERP
- Web/Micro Svcs

Services

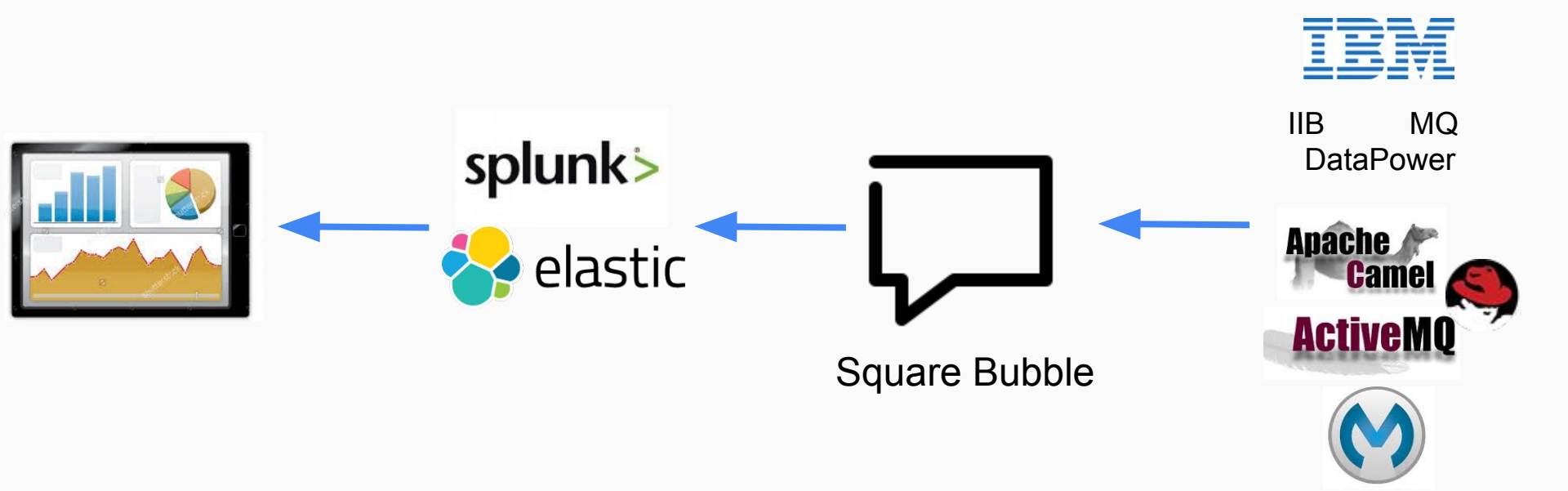
IIB MQ
DataPower

Integration Platform

Monitoring/BI

OpsDash

Logical Deployment View



Product Highlights

- Flexible deployment
  - Agent or Agentless
  - you decide where to burn the CPU
- Low footprint
  - typically averages <5% CPU usage on a SMP
  - java heap 128MB
- Quick Start config
- Highly configurable to reduce data to what is required
- Full online documentation
- Ships with >50 Dashboards (splunk & kibana)
- Certified on RedHat Enterprise Linux (V6 & V7)

What Interfaces do we use?

- REST for IIB Status data
- MQTT (embedded in IIB V10+) for:
  - Flowstats, and
  - Resources Statistics
- MQ (Java Client) for:
  - Flowstats,
  - Resources Statistics, and
  - MQ specific data & status
- JMX for:
  - Apache Camel
  - ActiveMQ (also via jolokia)

MQ specific data

- Queue Manager Status
- Queue Details
- Queue Stats
- Channel Status
- Connection Status
- Listener Status
- Service Status

PCF commands with generic processing and lookups

Queue Manager Status

- Dist: Inquire Queue Manager Status
- Z/OS: Inquire Queue Manager
- Fields:
  - **Q_MGR_NAME**
  - **Q_MGR_STATUS (STARTING, RUNNING...)**
  - **CONNECTION_COUNT**
  - Q_MGR_START_DATE
  - Q_MGR_START_TIME

Queue Details

- Inquire Queue Status
- Queue Name filtering (inc wildcards *)
- Fields:
  - **Q_MGR_NAME**
  - **Q_NAME**
  - **CURRENT_Q_DEPTH**
  - **OPEN_INPUT_COUNT**
  - **OPEN_OUTPUT_COUNT**
  - **OLDEST_MSG_AGE**
  - **Q_TIME_INDICATOR[1|2]**
  - LAST_GET_DATE, LAST_GET_TIME, LAST_PUT_DATE, LAST_PUT_TIME

Queue Stats

- Reset Queue Statistics
- Queue Name filtering (inc wildcards *)
- Fields:
  - **Q_MGR_NAME**
  - **Q_NAME**
  - **HIGH_Q_DEPTH**
  - **MSG_ENQ_COUNT**
  - **MSG_DEQ_COUNT**
  - TIME_SINCE_RESET

Channel Status

- Inquire Channel Names & Inquire Channel Status
- Fields:
  - **Q_MGR_NAME**
  - **CHANNEL_NAME**
  - **CHANNEL_STATUS**
  - **MSGS**
  - CHANNEL_TYPE
  - COMPRESSION_RATE
  - COMPRESSION_TIME

Connection Status

- Inquire Connection
- Fields:
  - **Q_MGR_NAME**
  - **APPL_TAG**
  - **ASYNC_STATE**
  - CONNECTION_ID
  - CHANNEL_NAME
  - CONNECTION_NAME
  - Q_MGR_UOW_ID

Listener Status

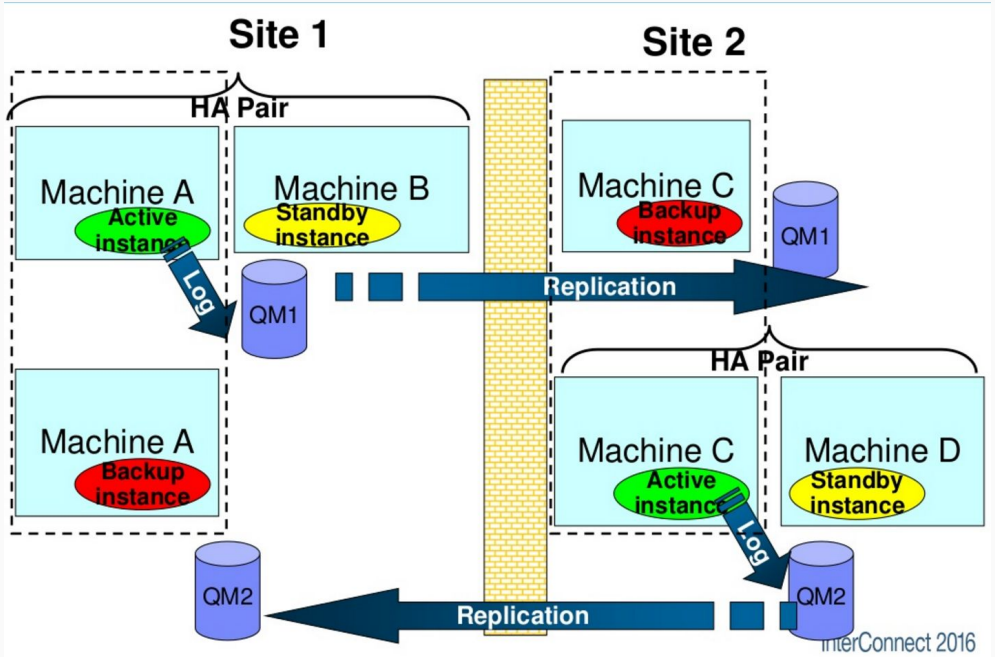
- Inquire Channel Listener and Inquire Channel Listener Status
- Not applicable on Z/OS
- Fields:
  - **Q_MGR_NAME**
  - **LISTENER_NAME**
  - **LISTENER_STATUS**
  - IP_ADDRESS, LISTENER_CONTROL, LISTENER_DESC LISTENER_START_DATE, LISTENER_START_TIME PORT, XMIT_PROTOCOL_TYPE

Service Status

- Inquire Service and Inquire Service Status
- Not on Z/OS
- Fields:
  - **Q_MGR_NAME**
  - **SERVICE_NAME**
  - **SERVICE_STATUS**
  - ALTERATION_DATE, CONTROL, DESC, START_ARGS, START_COMMAND, STOP_ARGS STOP_COMMAND, TYPE, STDERR_DESTINATION, STDOUT_DESTINATION

Practical guidance from the field

HA & DR Monitoring with Square Bubble

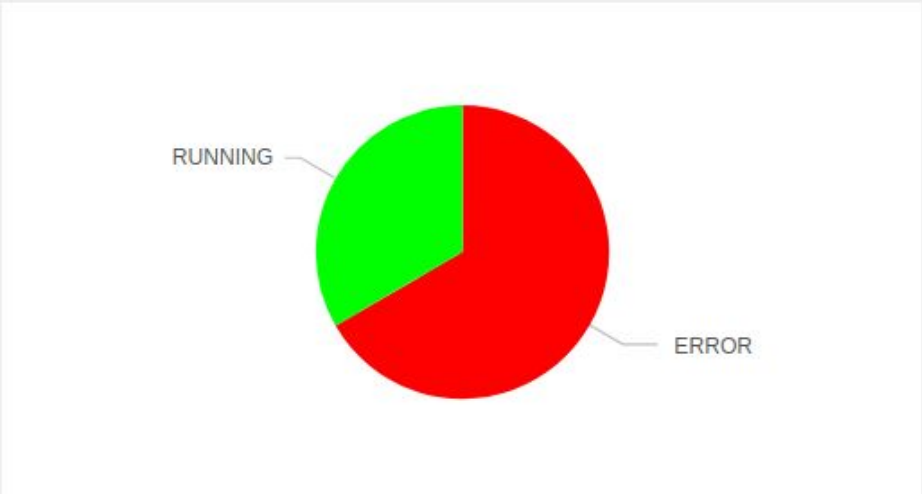


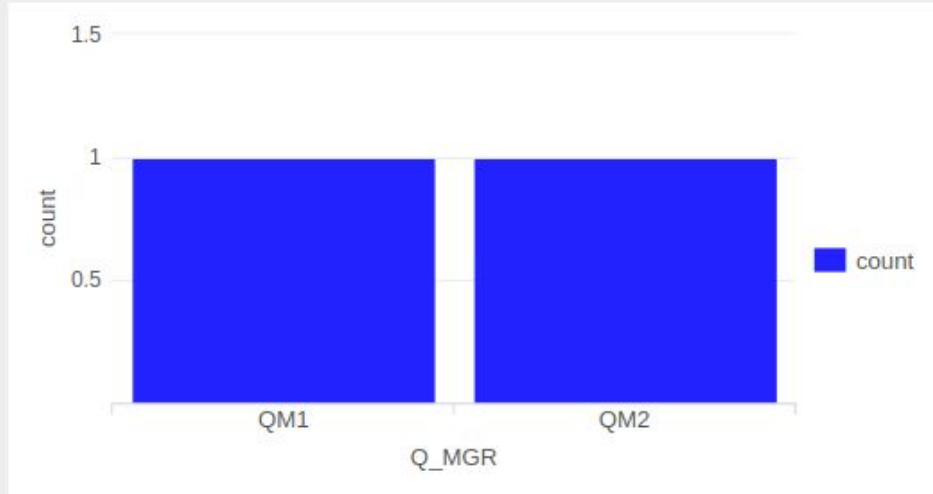
Each instance should be monitored independently

Naming and Schroedinger's Cat

- Things with the same name and type are the same logical instance e.g. MYAPP.QUEUE.IN
  - Averaged across the estate (High level)
  - Support Drill Down
- Multiple states RUNNING and NOT RUNNING
  - In our HA example we can check at least 1 Q_MGR is running
- Use management network where possible not load balanced or virtual IPs

Alternate Data Views





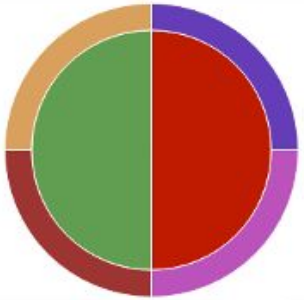
- Pie chart of Q_MGRs by state
- Column chart of RUNNING state by Q_MGR

Screenshots

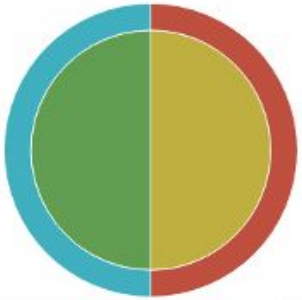
Dashboards in Splunk & Kibana

At a glance - IIB & MQ

Brokers by runMode



MQ Queue Managers by Status

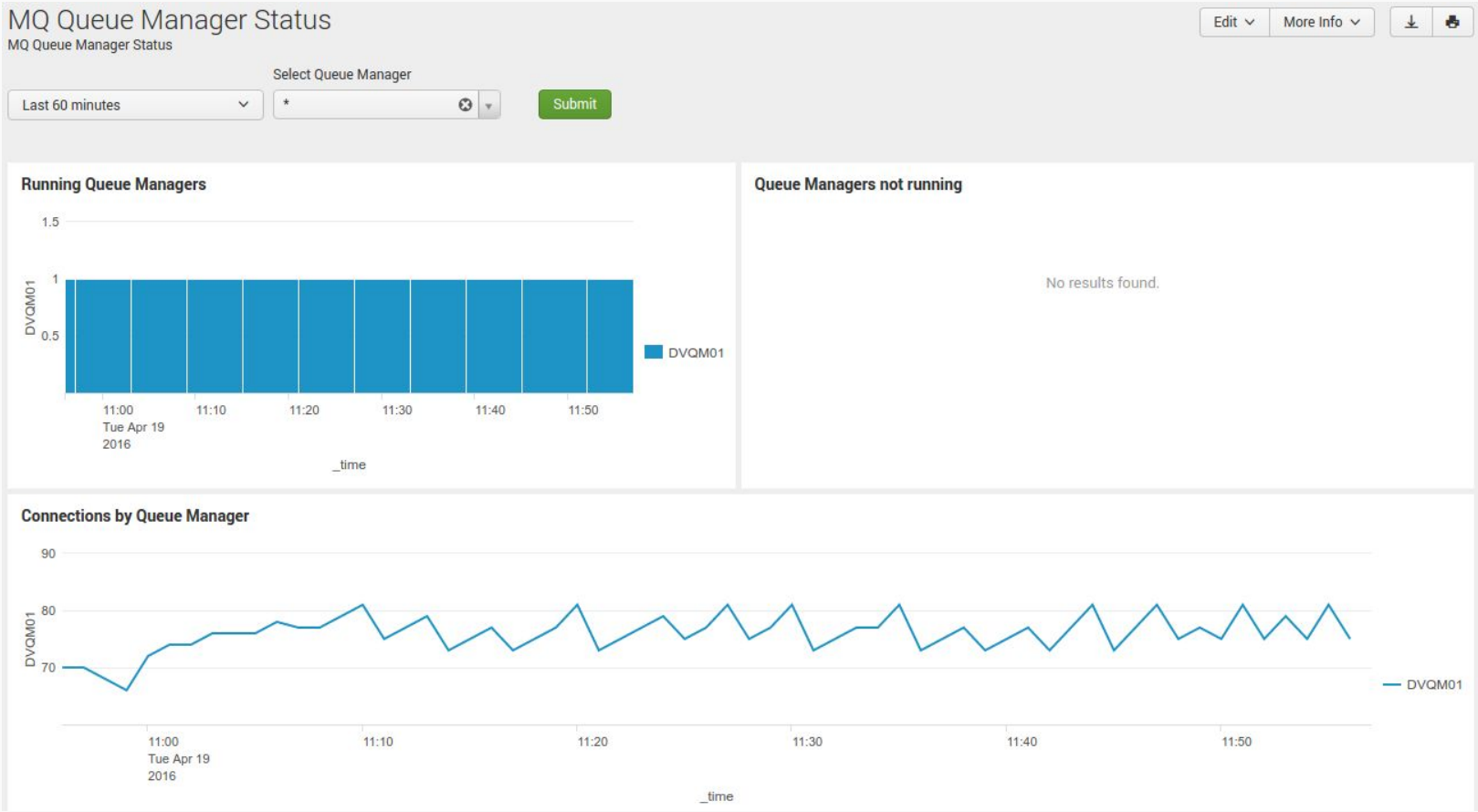


IIB Flowstats Overview by Total Messages

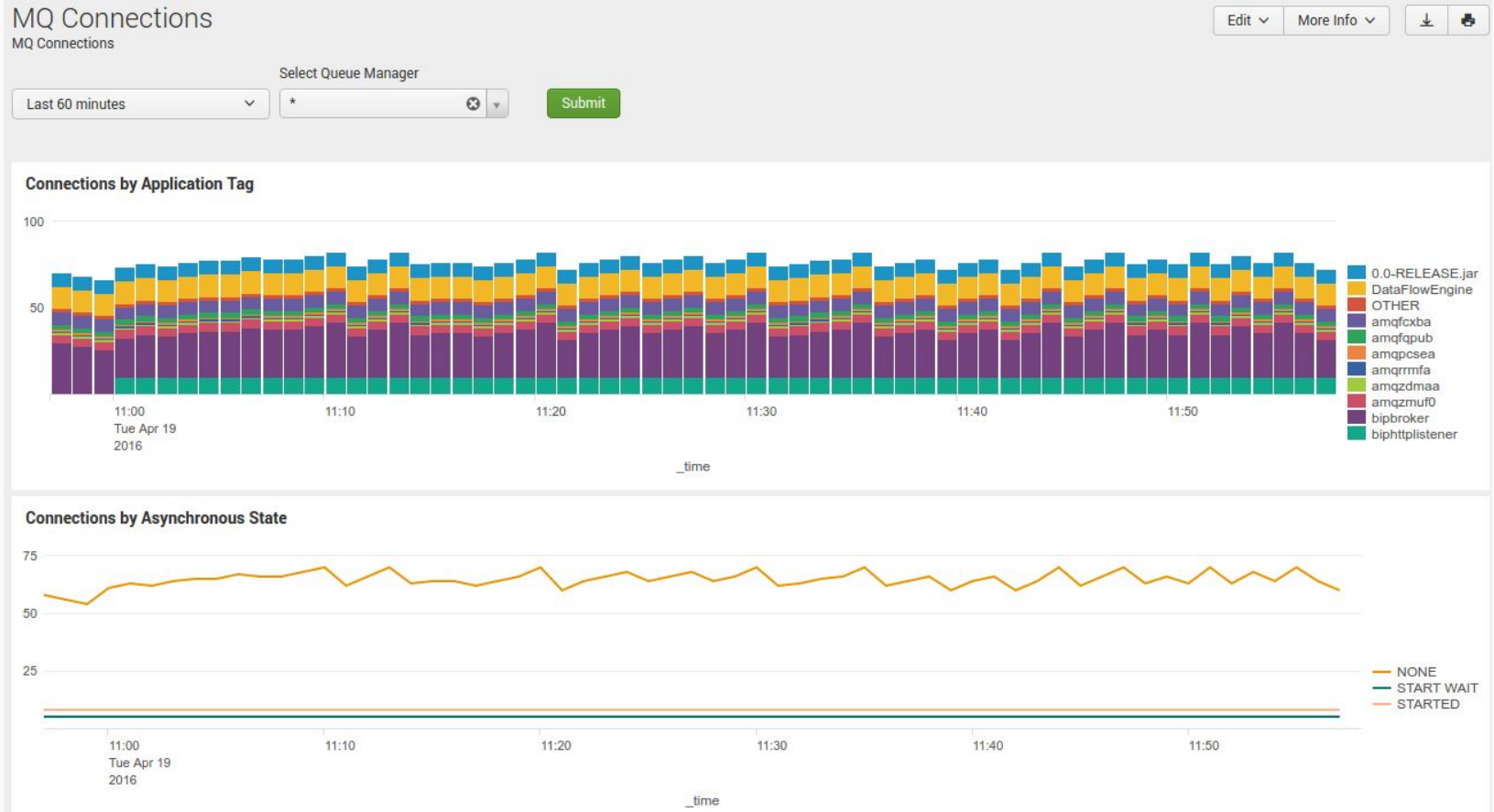
MQ Queue Summary Table

Q_NAME: Descending Q	Average CURRENT_Q_DEPTH	Average OPEN_INPUT_COUNT	Average OPEN_OUTPUT_COUNT	Average OLDEST_MSG_AGE
FLOW.1	0	0	0	0
FLOW.2	0	0	0	0
QUEUEIN1	0	0	0	0
QUEUEIN2	0	1	0	0
QUEUEIN3	0	1	1	0
QUEUEOUT1	0	0	0	0
QUEUEOUT2	0	0	0	0
QUEUEOUT3	0	1	1	0

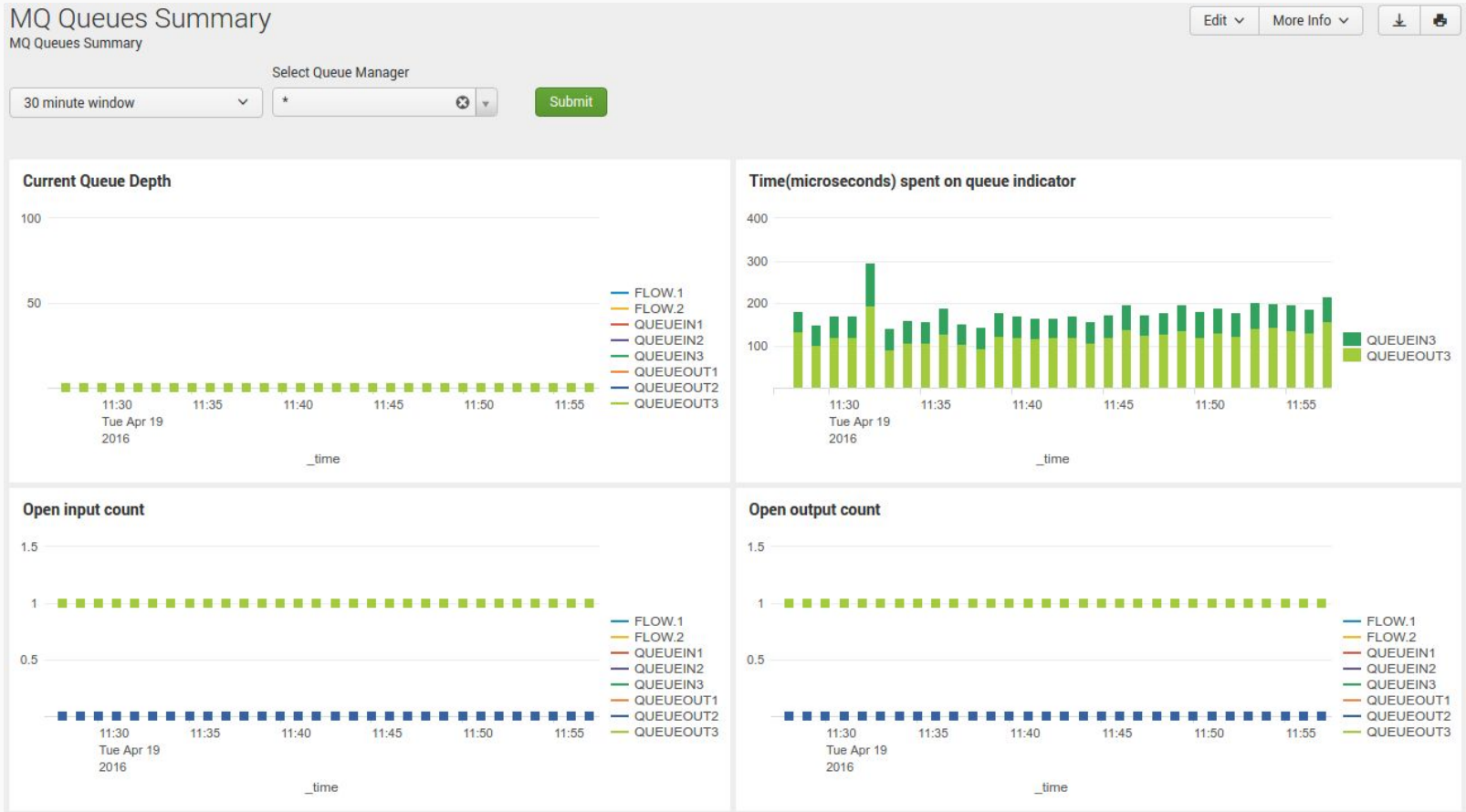
Queue Manager Status



MQ Connections



MQ Queues Summary



Exploitation & gaining more value

Customization

- Out of the box you can exploit a lot of capabilities with minimal effort
- Configuration allows you to (analogous to a query):
  - Reduce the data being collected, transformed, indexed and queried, and
  - Filter the data for specific value(s)
- Dashboards can be enhanced to give a more specific view
- Data can be combined with other sources to provide additional insights
- Customization is essential to overlay your service view

Exploitation, having all this data is great but we can go further

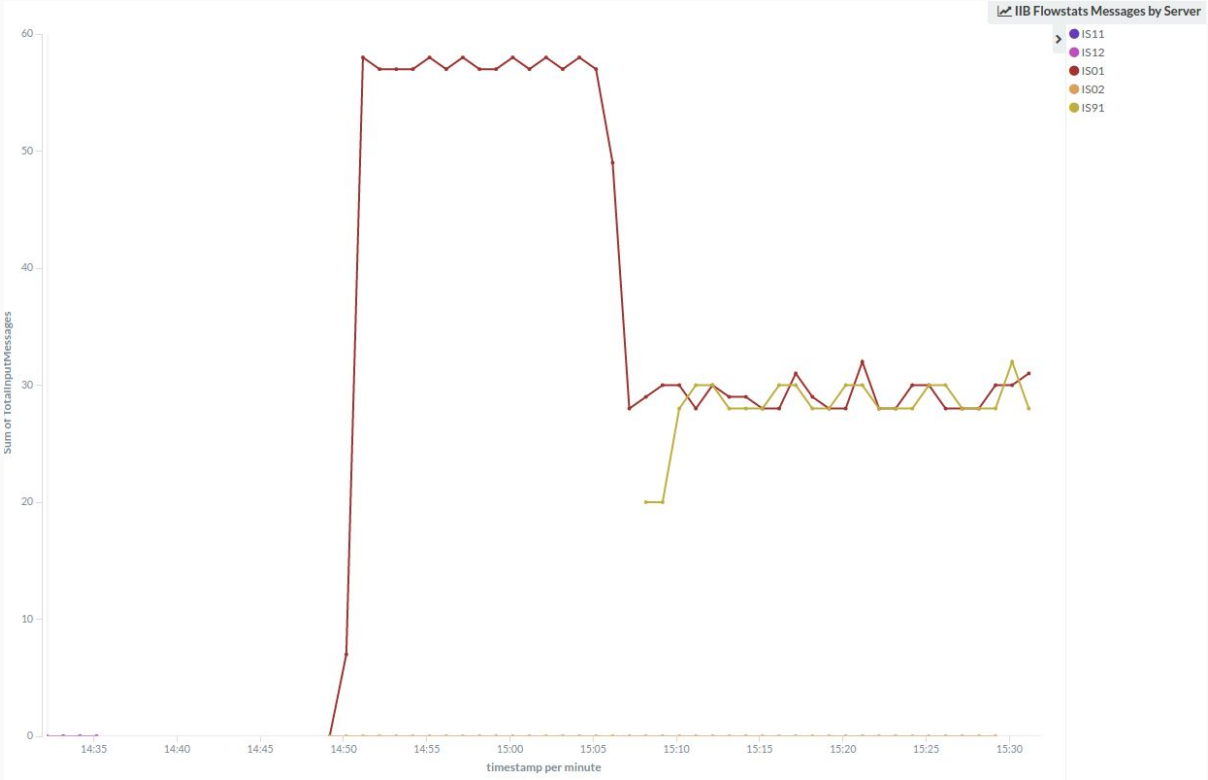
- Define alerts, such as:
  - When a known entity is not reported as running
  - When response time goes above a defined threshold
  - When queue sizes reach a defined threshold
- Automate actions, such as:
  - Start up another integration server when JVM memory is close to exhaustion
  - Stop an integration server or application when message volumes fall
  - Use historical data to help define thresholds
- These techniques can help to build an *adaptive system*

Exploitation scenario, start a server based on message flow

Load balancing automation based on historical data:

When message flow goes above 50 messages per minute for over 15 minutes, start another server.

For higher loads, we will respond more quickly



Log Management

Log Management

- **Wikipedia**: comprises an approach to dealing with large volumes of computer-generated log messages (also known as audit records, audit trails, event-logs, etc.). Log Management generally covers:
  - Log collection
  - Centralized log aggregation
  - Long-term log storage and retention
  - Log rotation
  - Log analysis (in real-time and in bulk after storage)
  - Log search and reporting.

Log Management

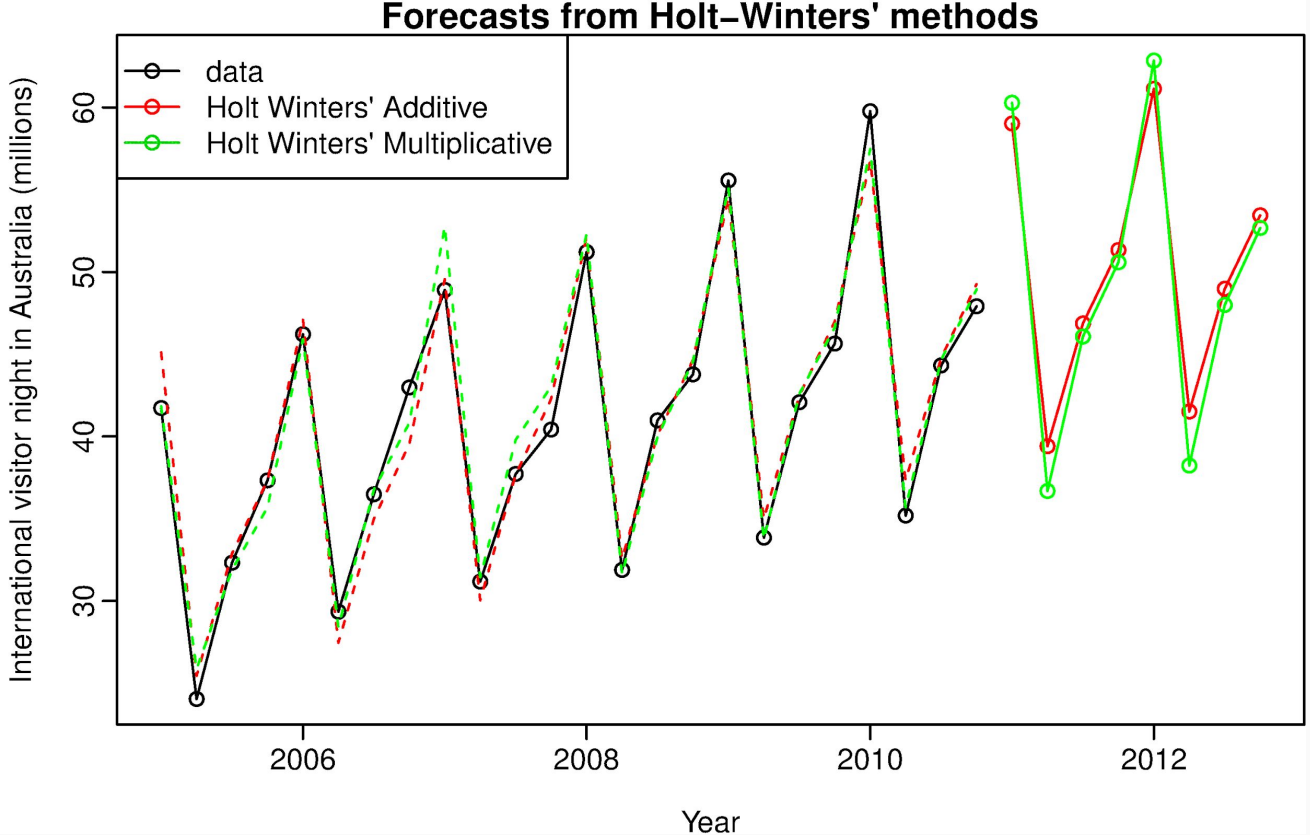
- We recommend you include:
  - Application logs
  - MQ logs
  - IIB logs
  - DataPower syslog (esp latency)
- Choice of tools with Square Bubble:
  - Splunk (Enterprise, Cloud & Light)
  - Elastic (recommended with X Pack)

Machine Learning

Machine Learning

- What is steady state?
  - Know your baseline
- What impacts performance?
- What impacts our costs?
- Machine learning can allow us to:
  - Predict future loads (Holt-Winters seasonal method)
  - Predict future failures (MTBF based on actual data)
  - Detect anomalies
  - Identify outliers
  - Define adaptive thresholds

Holt Winters example



Future...

Candidate versions & Features

- Integration Governance
  - Who is talking to who?
- MQ (gaps in the market):
  - MQ Event Messages (Auth, Config, Channel... prototype for Commands)
  - COA/COD reports
  - Stats from data from topics from V9
- DataPower (in trial), REST, SOMA & syslog (esp latency)
- API Connect
- IIB V-next
  - Standalone Integration Server support
  - App Connect integration

Where can you get more help?

Help is at hand

- Our valued partners can provide additional help:
  - Planning the deployment
  - Installation
  - Customization
  - Exploitation

More information, Q&A, demo … last slide

- More details are available on the web site http://squarebubble.io
- Any questions?
- Trial licenses are available on request...

Demo