What's new in the IBM Messaging Family

Mark Taylor, IBM Hursley

marke_taylor@uk.ibm.com

Timeline

IBM

Multi-instance QMGR

Multiple cluster XMIT queue

Hypervisors

System Pattern Application Pattern

Common criteria Eclipse

Integrated Messaging

XML

.NET

HTTP AJAX REST Web 2.0

Managed File Transfer

JMS SSL SOAP

Mobile

JMS 1.1 RCMS

20th Anniversary of MQ at IMPACT

V8

MQI Assured delivery

Multi-platform

Pub/sub

V7.5

V7.1

V7.0.1

V7

V6

V5.3

V5.2

V5.1

V5

V2.1

V2

V1.1

IBM MQ Appliance

IBM MQ Advanced

IBM MQ Advanced for Developers

IBM MQSeries

IBM MQ Everyplace

IBM MQTT

IBM MQ Low Latency

IBM MQ Managed File Transfer

IBM MQ Advanced Message Security

IBM MessageSight

IBM MQ Light

1990s

2000s

2010s

ROYAL ACADEMY of ENGINEERING
MacRobert Award 2004

2005 SIIA //CODiE// WINNER

JAVAPro 2006 READERS' CHOICE WINNER

End of Service for old platforms and versions

- MQ V7.0.0 and V7.0.1 for multiplatforms – EOM, EOS effective **September 2015**
  - V7.0 will have had more than 7 years of support

- MQ V7.0.1 for z/OS – EOM, EOS effective **September 2015**
  - V7.0 .0 already out of service

- MQ V3 for VSE – EOM, EOS effective **September 2015**
  - Extended support contracts available

- MQ V6 for OpenVMS: EOS effective **April 2016**

MQ Appliance

Introducing IBM MQ Appliance

- The scalability and security of IBM MQ V8
  - Integrates seamlessly into MQ networks and clusters
  - Familiar administration model for administrators with MQ skills

- The convenience, fast time-to-value and low total cost of ownership of an appliance

- Ideal for use as a messaging hub running queue managers accessed by clients, or to extend MQ connectivity to a remote location

- General availability 13 March 2015

Key characteristics of the IBM MQ Appliance

- "MQ V8" (+/-) delivered as a state-of-the-art appliance

- Built using the latest DataPower appliance hardware and OS

- Firmware includes the MQ V8 product and capabilities
  - Participates in MQ networks or clusters
  - Existing MQ applications connect as clients, with no code changes

- Two models, to suit different uses and performance requirements
  - Either model of appliance can run multiple queue managers, subject to overall throughput

- Familiar administration concepts and syntax, with a choice of interfaces

- Familiar security model for authentication and authorisation of messaging users, with greater flexibility for scalable administration

- Built-in High Availability
  - Per queue manager monitoring and automatic restart/failover
  - Without external dependencies like shared file systems or disks

Key differences compared with installable MQ

- "Hub" pattern; no applications deployed to the appliance
  - Applications must connect as remote clients

- No user exits can be run on the appliance
  - CHLAUTH and application activity trace

- Appliance-specific HA technology
  - With no shared file system or shared disk

- Authentication and authorisation via on-board or central repository

- Command-line interface on the appliance is not a general-purpose shell
  - Has familiar commands for things you need
  - e.g. no runmqlsr, because MQ listeners run under QM control

- Some monitoring information (included application activity trace) activated and produced differently
  - pub/sub

MQ News

IBM MQ V8 delivering best in class enterprise messaging

Platforms & Standards	Security	Scalability	System z exploitation
64-bit for all platforms	Userid authentication via OS & LDAP	Multiplexed client performance	64-bit buffer pools in MQ for z/OS means less paging, more performance
Multiple Cluster Transmit Queue on all platforms	User-based authorisation for Unix	Queue manager vertical scaling	Performance and capacity
Support for JMS 2.0	AMS for IBM i & z/OS	Publish/Subscribe improvements	Performance enhancements for IBM Information Replicator (QRep)
Improved support for .Net and WCF	DNS Hostnames in CHLAUTH records	Routed publish/subscribe	Exploit zEDC compression accelerator
SHA-2 for z, i & NSS	Multiple certificates per queue manager		SMF and shared queue enhancements

MQ V8 Dates

- Announce: 22 April 2014

- Availability:
  - 23 May 2014 (eGA Distributed)
  - 13 June 2014 (z/OS and pGA Distributed)

- **FP3** on Distributed platforms now available

- On z/OS, PI19721 for migration PTF
  - Also recommended PI19991 QTYPE APAR
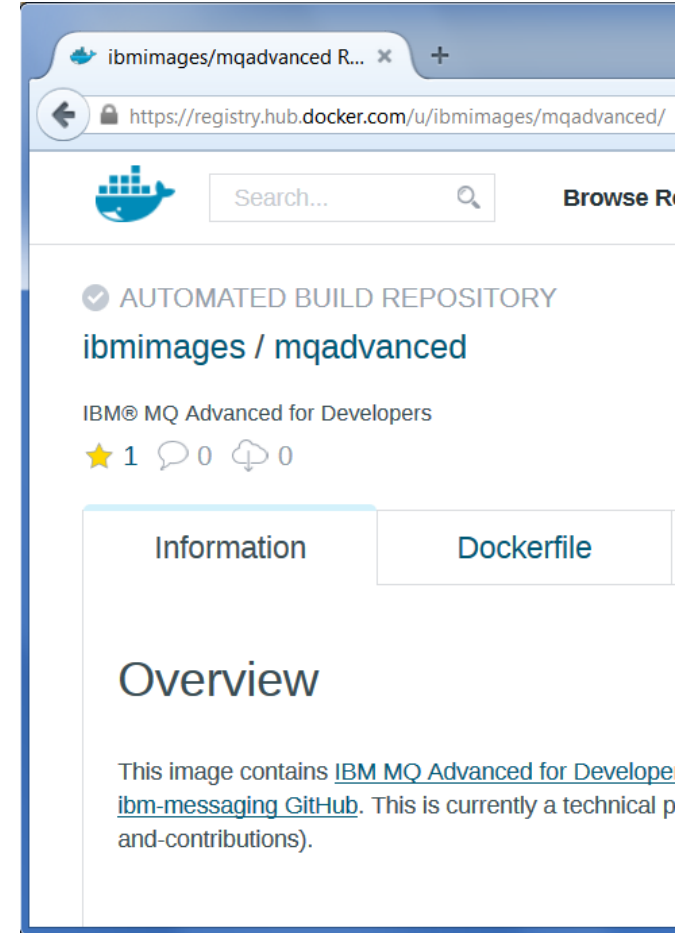
FixPacks and "Continuous Delivery"

- V8.0.0.3 FixPack released June 18 for all distributed platforms

- As in previous V8 updates, new function alongside the usual APARs

- Some new function automatically enabled, some requires specific configuration
  - Often gated by CMDLEVEL (similar to NEWFUNC on z/OS)
  - Have to restart queue manager to say that you want to use new configuration
  - strmqm –e CMDLEVEL=802 QMGR

- CMDLEVEL has no direct relationship to VRMF
  - CMDLEVEL associated with V8.0.0.2 was 801

Platforms

- New MQ platform: Power Linux little-endian
  - Part of a broader portfolio of IBM software for this platform

- New support for SELinux configurations
  - See http://www-01.ibm.com/support/docview.wss?uid=swg21714191

- Statement of Direction for MQ V8 on HP NonStop
  - "IBM® intends to introduce a new release of IBM MQ for the HP NonStop platform that is based on IBM MQ V8. It is intended for this offering to be available for both the HP Integrity NonStop servers on Intel™ Itanium™, and compatible also for the new HP NonStop platform on x86 architecture. It is planned for this offering to be designed to deliver the capabilities of the current IBM MQ V8 product, but with optimizations for the HP NonStop platform, and will work with other IBM MQ and WebSphere® MQ offerings."
  - http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS214-535&appname=USN

Platforms - MQ in Docker

- A technical preview Docker image for MQ Advanced for Developers is now available on Docker Hub.
  - https://registry.hub.docker.com/u/ibmimages/mq/

- Runs an MQ queue manager inside a container, isolated from the rest of your system

- You can create your own customized image, using this image as a parent, for example, to:
  - Run MQSC commands to configure the queue manager
  - Add users and groups

- This is a technical preview and we would like to receive feedback

ibmimages/mqadvanced R...   ✕   +

🔒 https://registry.hub.docker.com/u/ibmimages/mqadvanced/

Search...   🔍   **Browse R**

✓ AUTOMATED BUILD REPOSITORY

ibmimages / mqadvanced

IBM® MQ Advanced for Developers

⭐ 1   💬 0   ☁ 0

Information | Dockerfile

Overview

This image contains IBM MQ Advanced for Develope
ibm-messaging GitHub. This is currently a technical p
and-contributions).

MQ Security - Authorisation using LDAP

- Fixpack 2 for Unix/Linux/i builds on LDAP authentication feature

- User and group information can now be centrally located in LDAP
  - No need to define OS users/groups other than mqm
  - And "mqm" group loses a lot of its automatic power

```
setmqaut –t qmgr –p "cn=User 1,ou=users,o=ibm,c=uk" +connect
setmqaut –t qmgr –g "cn=Group 1,ou=groups,o=ibm,c=uk" +connect
```

- Extended attributes on AUTHINFO/IDPWLDAP object show how to discover groups
  - Very similar to the authentication attributes for discovery of identities

- Requires queue manager command level to be updated
  - Similar to NEWFUNC on z/OS

```
strmqm –e CMDLEVEL=801 QMgr
```

New in FP2

- Authorities can be set for individual users
  - Does not use "primary groups"

MQ Security – Authentication via PAM

- For Unix platforms

- Configure authentication to go via PAM modules

- Gives more flexibility in mechanisms for verification and account validation
    - For example, use in conjunction with nsswitch to store Unix account information in Active Directory

- Requires queue manager command level to be updated
    - Similar to NEWFUNC on z/OS

strmqm –e CMDLEVEL=802 QMgr

- AUTHENMD(OS|PAM) as attribute on AUTHINFO(IDPWOS)

New in FP3

CipherSpec currency

- 2014-2015: Security vulnerabilities with cool names
    - Heartbleed, POODLE, BEAST, FREAK, Bar Mitzvah, LogJam
    - Secure protocols as well as crypto algorithms found to have vulnerabilities

- Before V8.0.0.3, 44 different CipherSpecs to choose from
    - SSLv3, TLSv1.0, TLSv1.2

- With V8.0.0.3, subset of just 17 CipherSpecs
    - TLSv1.0, TLSv1.2
    - Predominantly Ecliptic Curve, AES and SHA-2 based

- It is possible, but not recommended, to re-enable the older CipherSpec
    - Environment variable or qm.ini

- Errors if you define or start a channel with a deprecated CipherSpec
    - Changes also made to older in-service versions of MQ

Updates in FP3

Distributed Performance: Persistent Messaging

- An AIX system: Max performance increased from 16K to 19K

MQI Local Bindings (2KB Persistent) : RR-1

Legend:
- V7.5GM round trips/sec
- V8.0GM round trips/sec
- V7.5GM CPU%
- V8.0GM CPU%

X-axis: Requester Connections
Y-axis (left): Round Trips/sec
Y-axis (right): CPU%
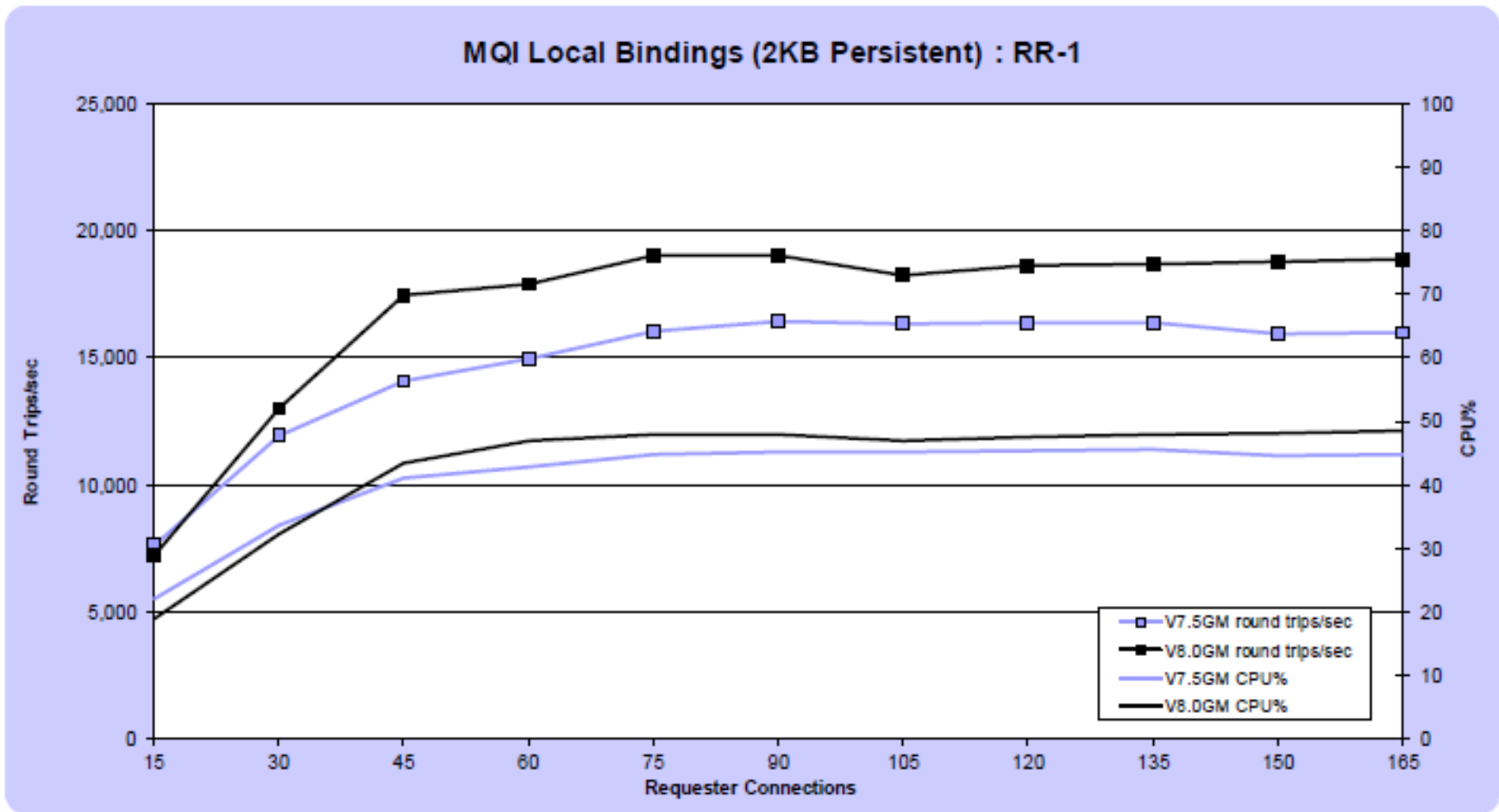
Distributed Performance: Non-persistent Messaging

- A Windows system: Max performance increased from 90K to 121K

MQI Local Bindings (2KB Non-persistent) : RR-1
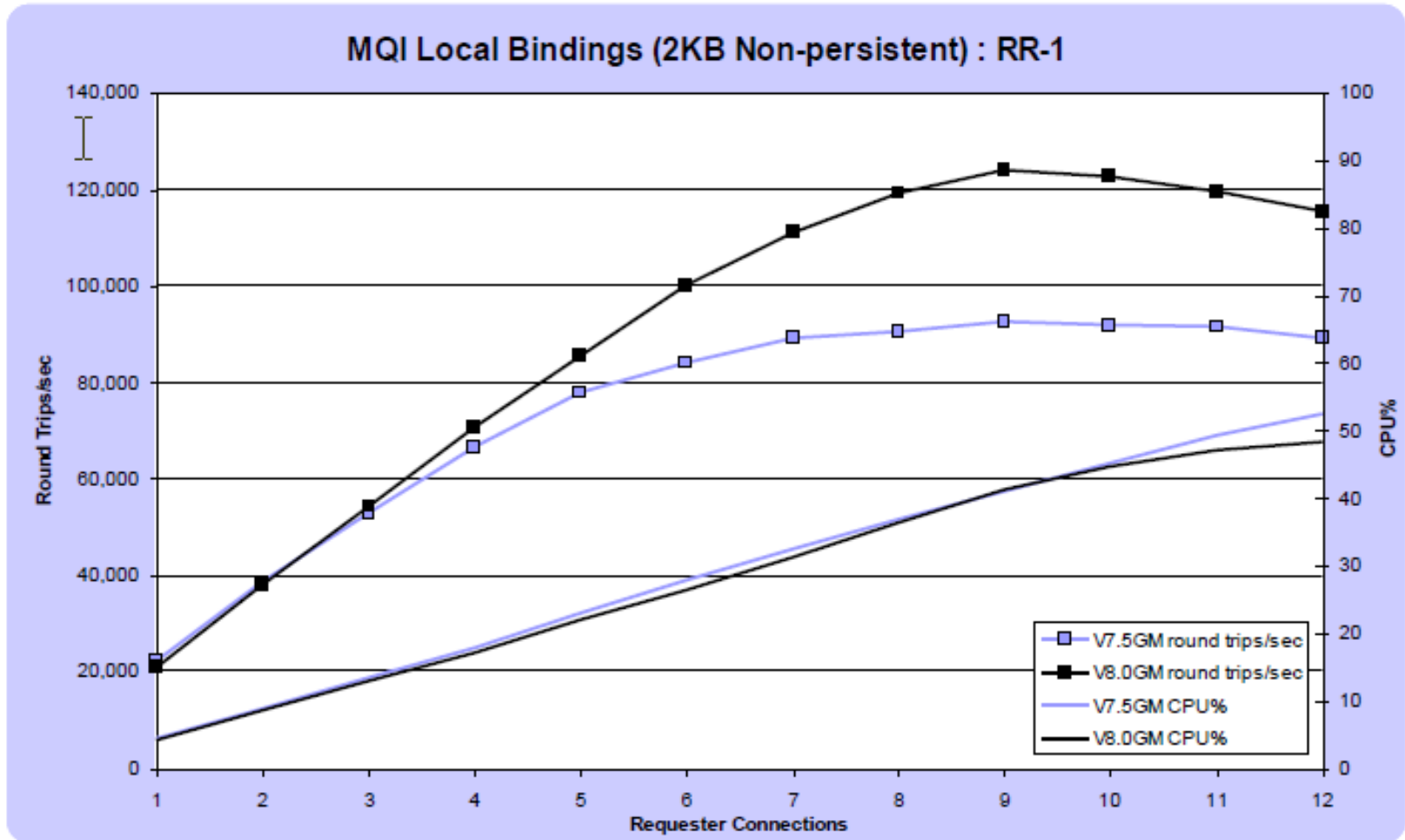
z/OS Performance: Sample CPU saving using large buffer pools

QREP workload: Cost per message - 10KB persistent messages

Legend: ■ Capture Application (putter) ■ Capture QM ■ Capture CHINIT (getter)
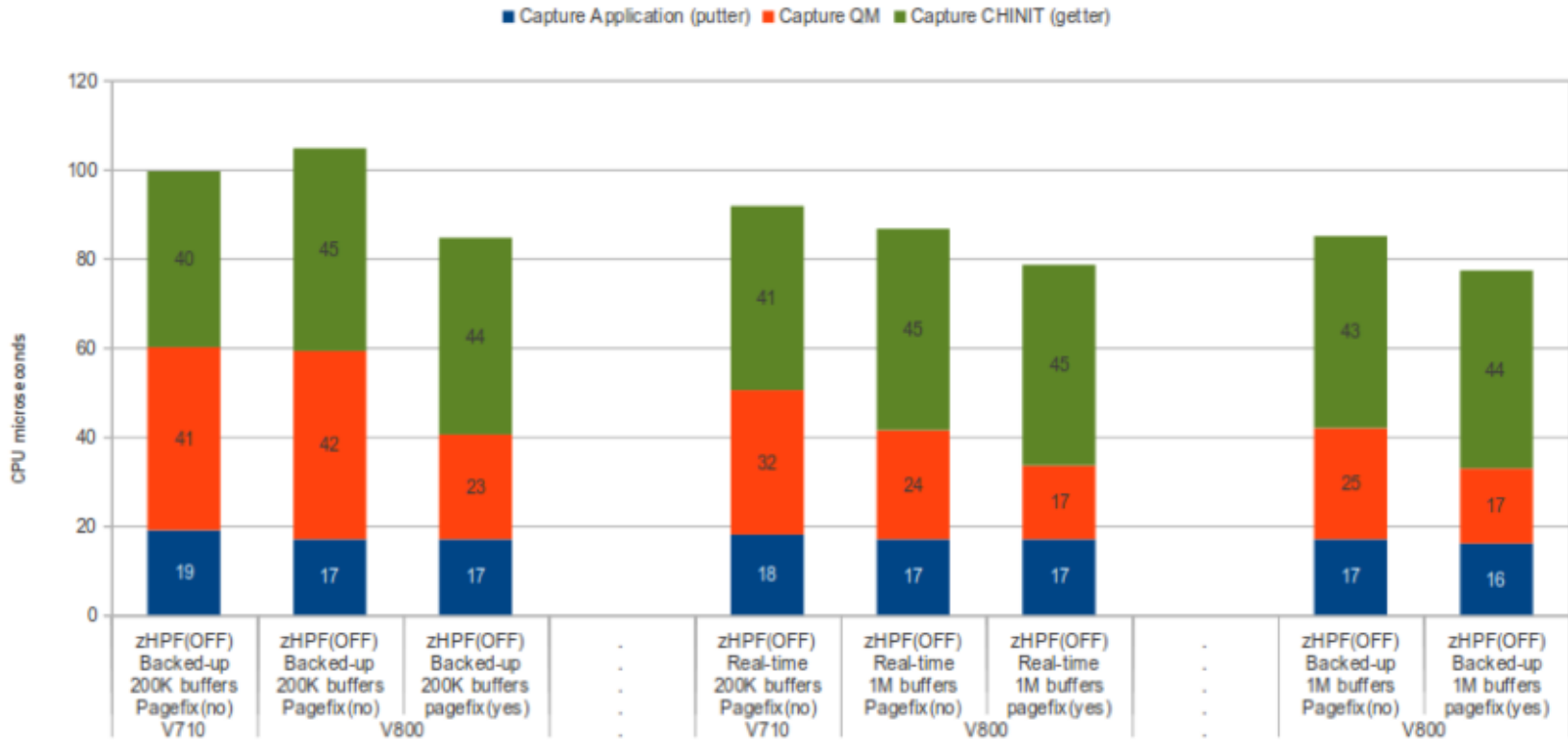
For a QRep workload, MQ V8 exploiting large fixed buffers moves 12GB of data significantly faster than V71 with total cpu cost of moving messages reduced by ~**20%**. Up to 120% faster movement of data.

Extended Start events

- Allows system monitoring applications to see when a multi-instance qmgr has failed over and where it is now running

- Event now includes a reason and the hostname where qmgr is running

- New MQRQ values – failover permitted, failover not permitted, started from standby

- Live demo at
  - **https://youtu.be/crzmPciJc9g**

New in FP3

```
Event Type                          : Queue Mgr Event
Reason                              : Queue Mgr Active
Event created                       : 2015/06/16 10:24:58.02 GMT
  Queue Mgr Name                    : V8003_A
  Host Name                         : rockall.hursley.ibm.com
  Reason Qualifier                  : Failover Not Permitted
```

Monitoring the MQ Appliance

- The MQ Appliance will automatically generate status information
  - Uses pub/sub to support multiple consumers

- Sample program shipped in V8.0.0.3 – amqsrua/amqsruac
  - Also source code

- Shows system resource usage, not just MQ
  - CPU, Disk usage, MQI counts etc

- Subscribe to metadata showing which statistics can be obtained
  - More flexible than a fixed set
  - Then subscribe to topics for each statistic

New in FP3

New function: Extended channel exit interface

- Channel exits are now told more information about what is at the other end of the connection
  - MQCXP structure contains RemoteProduct and RemoteVersion fields
  - Gives VRMF of what is connecting eg 07050003 (interpreted as 7.5.0.3)
    - Blank implies V6 or older
  - Gives type of connection – client (C, Java etc), queue manager (Dist, z/OS)

- Typical use to allow an exit to block connections from backlevel clients

- RPRODUCT strings are described in DIS CHSTATUS
  - Search for q086090_ in KnowledgeCenter

New in FP3

JMS and Java

- JMS to be supported inside CICS
  - CICS APAR
    - For V5.2 PI32151
  - MQ APARs
    - For V71: JMS PI29770 (supercedes 7.1.0.6) or later CSD
    - For V8: JMS 8.0.0.2 or later CSD + MQ base PI28482

- CipherSuite names for non-IBM Java runtimes
  - There is no fixed standard across Java providers for CipherSuite names
  - When POODLE SSL vulnerability announced, it was difficult to use TLS algorithms in MQ Java because names in configuration had to match IBM's Java names
  - Have now relaxed some of that checking to make use of other Javas easier
  - IV66840: ADD SUPPORT FOR SELECTED TLS CIPHERSPECS WHEN RUNNING IN NON-IBM JAVA RUNTIME ENVIRONMENT
    - http://www-01.ibm.com/support/docview.wss?uid=swg1IV66840

- Java client now available for simpler redistribution

.Net enhancements

- MQ .Net classes can now use SSL without needing the C client installed
  - A secure fully-managed .Net implementation
  - Uses Windows native certificate stores

- For MQ .NET classes (aka Base .NET Classes) SSL properties can be set at
  - MQEnvironment.cs
  - Hashtable properties (input parameter to MQQueueManager constructor)

- For XMS .NET, SSL properties can be set as ConnectionFactory properties

- WCF interface extended to non-SOAP, non-JMS messages
  - Making it easier for apps using WCF to communicate with any other MQ application

- MQ .Net classes restructured for easier deployment (New in FP2)
  - Applications can be deployed incorporating the MQ assembly
  - Includes Azure environment

MQ Pattern Type for Pure Application System

- MQ as a **Software Component** plus supporting **script packages**
  - Prerequisite to building a deployable **Pattern**

- All wrapped up in an easy to consume **MQ PatternType**

- Different mission to the previous hypervisor and Virtual Application deliverables
  - OS and Software now separated

Some SupportPacs now on github

- Source code to make it easier to extend platform coverage

- Can accept public submissions for new function (or bug fixes)

- Includes MA01 and MO03 (q and qload)

- See https://ibm-messaging.github.io/

MQ Light

MQ Light as a Service

MQ Light in MQ

IBM Messaging
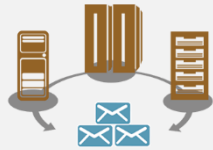
Enterprise Messaging

Deliver Messaging Backbone for Enterprise

Focus on traditional MQ values, rock-solid enterprise-class ser... ease-of-operation, b... of platform coverage... availability, z/OS exploitation

Application Messaging

Enable Developers to build more scalable, responsive applications

...on app use cases, ...n of languages, ...f-deployment, micro ...es, integration with ...er frameworks

**Development agility
&
Enterprise quality
of Service**

MQ Light : Software and Cloud

- Messaging that application developers will love to use, helping them make responsive applications that scale easily

- 3 ways to get it:
  - MQ Light software download
  - Bluemix service
  - *Statement of Direction for support in MQ Version 8.*

- Open APIs crafted to feel natural in a growing range of popular languages

- Tooling that makes modular app development easy

MQ Light API - Language support

Node.js

**AMQP 1.0
Open, standard, wire protocol**

Node.js

…

Python

PHP

Java*

Ruby

***JMS 1.1 in Bluemix today**
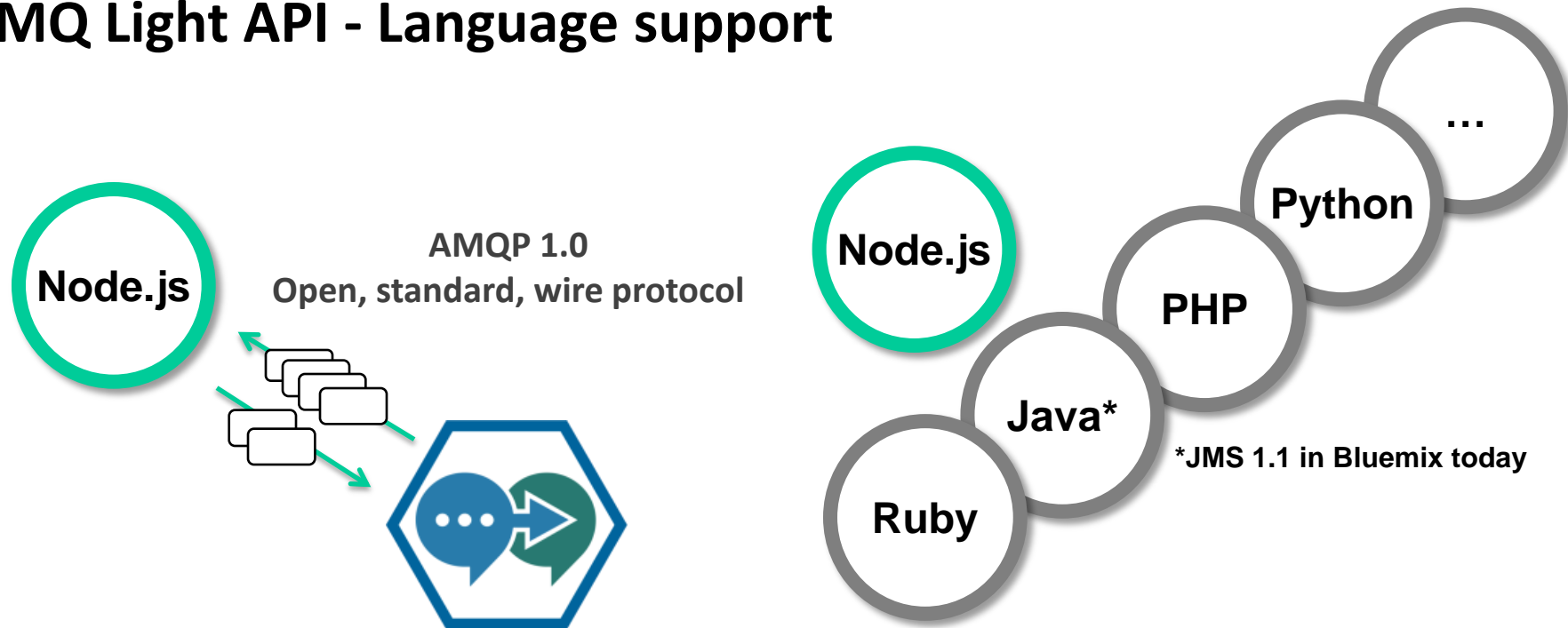
- Idiomatic APIs for each language.

- New clients can be created by developers
  - Clients based on Open source Apache Qpid Proton

- Using open protocol (AMQP 1.0) to build community around messaging clients

Deployment options

"MQ Light"

IBM MQ

MQ Light for Bluemix
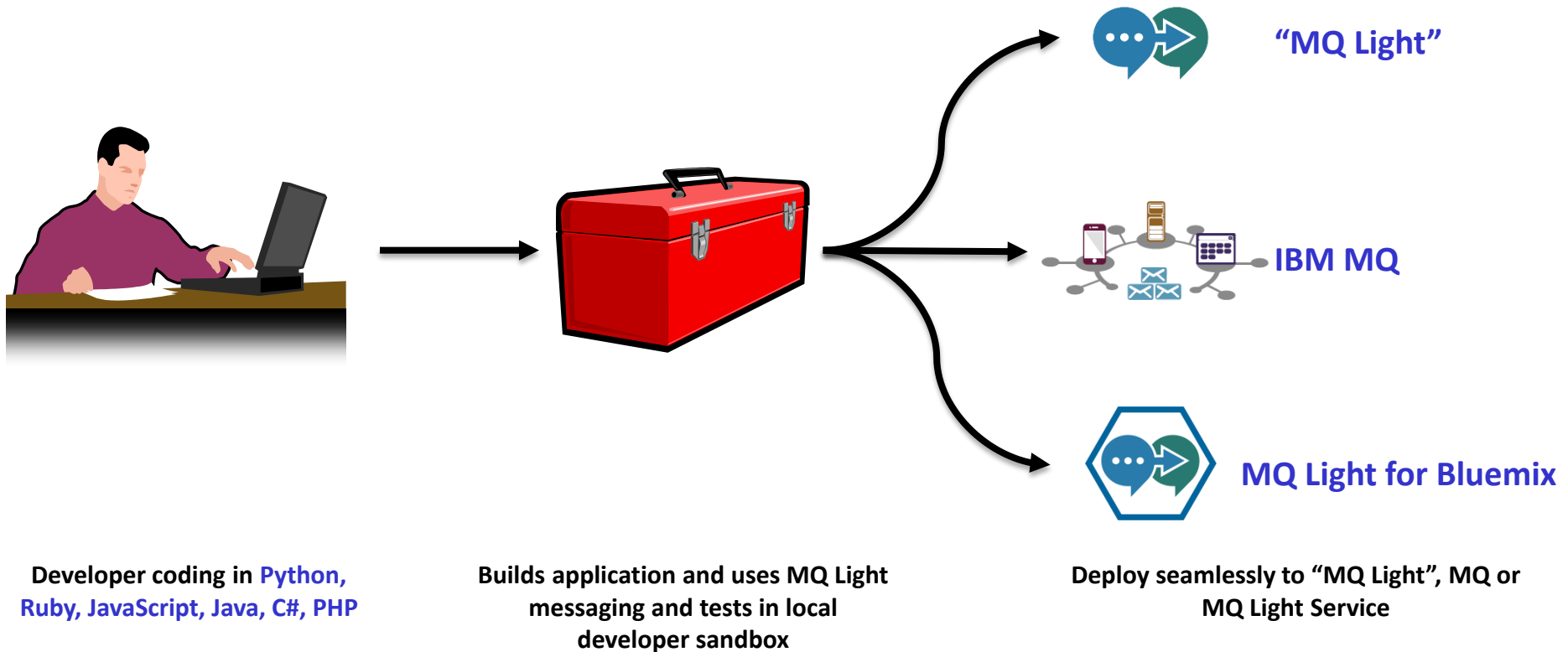
Developer coding in **Python, Ruby, JavaScript, Java, C#, PHP**

Builds application and uses MQ Light messaging and tests in local developer sandbox

Deploy seamlessly to "MQ Light", MQ or MQ Light Service

MQ Light Service in Bluemix

MQ Light in Docker

- A Docker image for MQ Light is now available on Docker Hub.
    - https://registry.hub.docker.com/u/ibmimages/mqlight/

- MQ Light runs inside a container, isolated from the rest of
    - Process isolation – all the processes associated with MQ Ligh
      process space, and can't see any other processes running on
    - Resource isolation – you can limit the amount of memory an
      container
    - Dependency isolation - all software which MQ Light depends
      Light image, except the Linux kernel itself.

- Docker also helps with fast, reliable deployments in cloud environments

- **One** command to download and run MQ Light:
    - `docker run –e LICENSE=accept –P ibmimages/mqlight`

MQ Light Support in IBM MQ

1Q15

- **Regular Updates to Early Access**

3Q14

- **IBM MQ V8.0.0.2**
- **IBM MQ - MQ Light Tech Preview**

- **MQ Light GA**
- **MQ Light Service GA**

2Q14

4Q13

- **MQ V8 Announce**
- **Statement of Direction - MQ Light Support in IBM MQ**
- **MQ Light Beta**

MQ Light Alpha
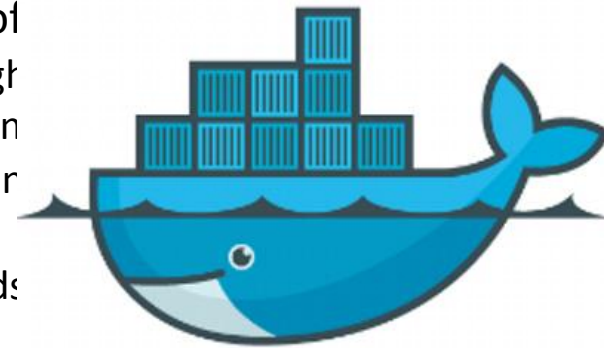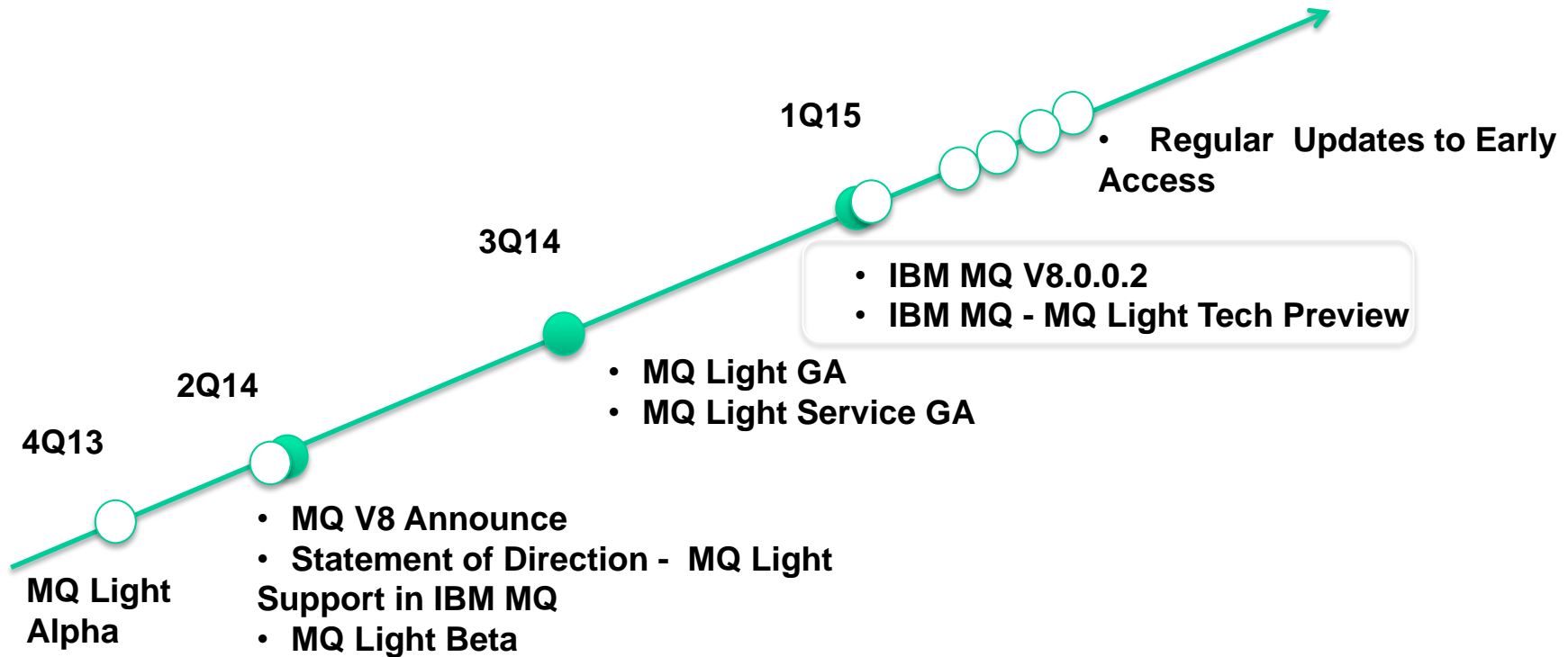
IBM MQ – MQ Light Tech Preview

- Platforms
  - Windows , Linux x86_64

- Installation
  - Prereq is IBM MQ V8.0.0.2
  - **Add** Tech Preview install media (zip, rpm)

- Adds AMQP 1.0 channels
  - Fully interoperable with MQ FAP and MQTT Channels

- MQSC and PCF support
  - Defining AMQP channels
  - Start, stop and end channel

- V8.0.0.3 + updated MQ Light Tech Preview has further integration
  - MQ Explorer support for the AMQP channels
  - Use of CHLAUTH rules to control connections
  - Use of the queue manager keystore for TLS connections

Updates with FP3

Future Activity

Continuous Delivery

- Expect more features to be delivered via service stream
    - For both z/OS and Distributed products

- FP2 included LDAP authorisation and MQ Light (AMQP) integration

- FP3 included PAM authentication

- More features expected to turn up in FP4 and beyond

- Active beta program for z/OS to try out some new features

Any questions?