



VSI Business, Roadmap & New Products Overview – May, 2019

Ray Turner
VMS Software Incorporated

Notice

This information contains forward looking statements and is provided solely for your convenience.

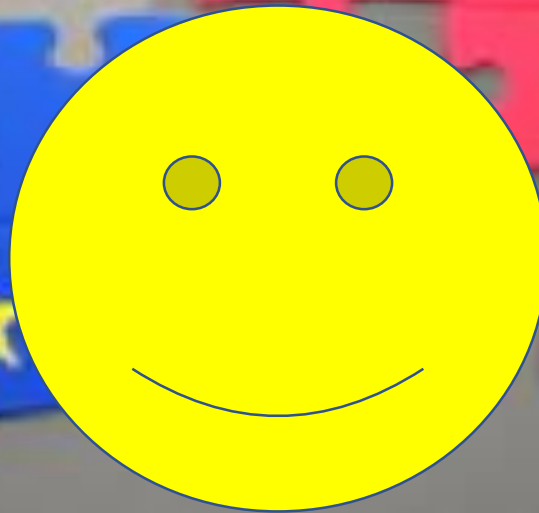
While the information herein is based on our current best estimates, such information is subject to change without notice.

Agenda

- Introduction
- VMS Software, Inc. (VSI): Leading OpenVMS into the Future
- OpenVMS Roadmaps
- VSI New Products (More in Brett's presentation)
- Q&A

Brexit

- VMS Software Incorporated (VSI) have assessed the impact of potential Brexit scenarios
- We have perceived no impact on OpenVMS which will continue to function whatever the UK do.....whenever they do it!



OpenVMS is still used and trusted by major organisations in almost every business segment.

The core values that brought customers to OpenVMS are as applicable today as they were in the past.

Computer Weekly

“There are OpenVMS clusters operating with uninterrupted service uptimes in excess of 18 years. OpenVMS is one of the industry’s best-kept secrets.”

High
availability

Security
by design

Stability

You are not alone!

(Major Organizations use OpenVMS Today)

- Financial Services
- Manufacturing
- Healthcare
- Defence
- Retail
- Distribution
- Energy
- Public Transit
- Automotive
- Aerospace
- Education
- Gov't Classified
- & More

The Transition of OpenVMS

- In 2013, HP announces end of support for OpenVMS.
- In 2014, VSI purchases the Rights to OpenVMS from HP.
 - What did VMS Software, Inc. purchase from HP?
 - VSI has the Exclusive rights to develop new versions of OpenVMS
 - VSI has the Perpetual Worldwide License
 - VSI has the Right to use the OpenVMS trademark and other marketing rights
 - VSI has the Right to release OpenVMS on any hardware (including the mainstream Intel x86 platform)

Transition from HPE to VSI

- 2015 - HPE end of new Alpha License sales.
- 2015 – VSI introduces its first upgraded Integrity product and its 4 levels of “Best in Class” support.
- 2016 – VSI introduces additional Integrity licenses and expanded VSI support.
- 2017 – VSI introduces two new Alpha products.
 - Alpha V8.4-2L1
 - Alpha V8.4-2L2 Performance Build
- 2018 - HPE OpenVMS Integrity (V8.4 and earlier) obsoleted from HPE Price List.
- 2019 – Removal of VSI OpenVMS Licenses and Support part numbers from HPE Price List meaning HPE will not sell any new VSI products effective after June 30, 2019.
- 2020 - HPE OpenVMS V8.4 standard support ends on December 31.

Transition from HPE to VSI

Removal of VSI OpenVMS License and Support part numbers from HPE Price List means... HPE will not sell any new VSI products after June 30, 2019.

- What were the factors that lead HPE to this decision?
 - HPE's original 2013 Announcement to exit the business by 2020.
 - HPE's recognition that "VSI has the execution capabilities to assure the long term satisfaction for OpenVMS customers and partners".
- What "Call to Actions" have been given to the HPE Organization?
 - HPE Sales are to redirect customer inquiries for VSI products to VSI effective June 30, 2019.
 - HPE Channel Partners are to engage with VSI to secure reseller arrangements for VSI products.
- What are the ways OpenVMS customers can purchase new VSI products and support?
 - VSI Direct
 - VSI Reseller or Channel Partners
 - In "special" situations, HPE DCC customers may be able to work locally with their HPE subsidiary to purchase VSI licenses and VSI support and gain the desired benefits that only VSI can offer.
- What are some of the benefits of working with VSI direct or through Channel Partners?
 - **The Rights to New Versions** - Meaning that when customers purchase VSI upgraded licenses with VSI support from VSI or a VSI Partner, they have the right to automatic upgrades and future license upgrades at no cost. This includes the upcoming V9.2 major releases on Alpha, Integrity and x-86 products.
 - The knowledge that customers are working with the organization dedicated to the future of the OpenVMS Operating System. VSI Worldwide Support Team. VSI Professional Services. VSI Training programs.

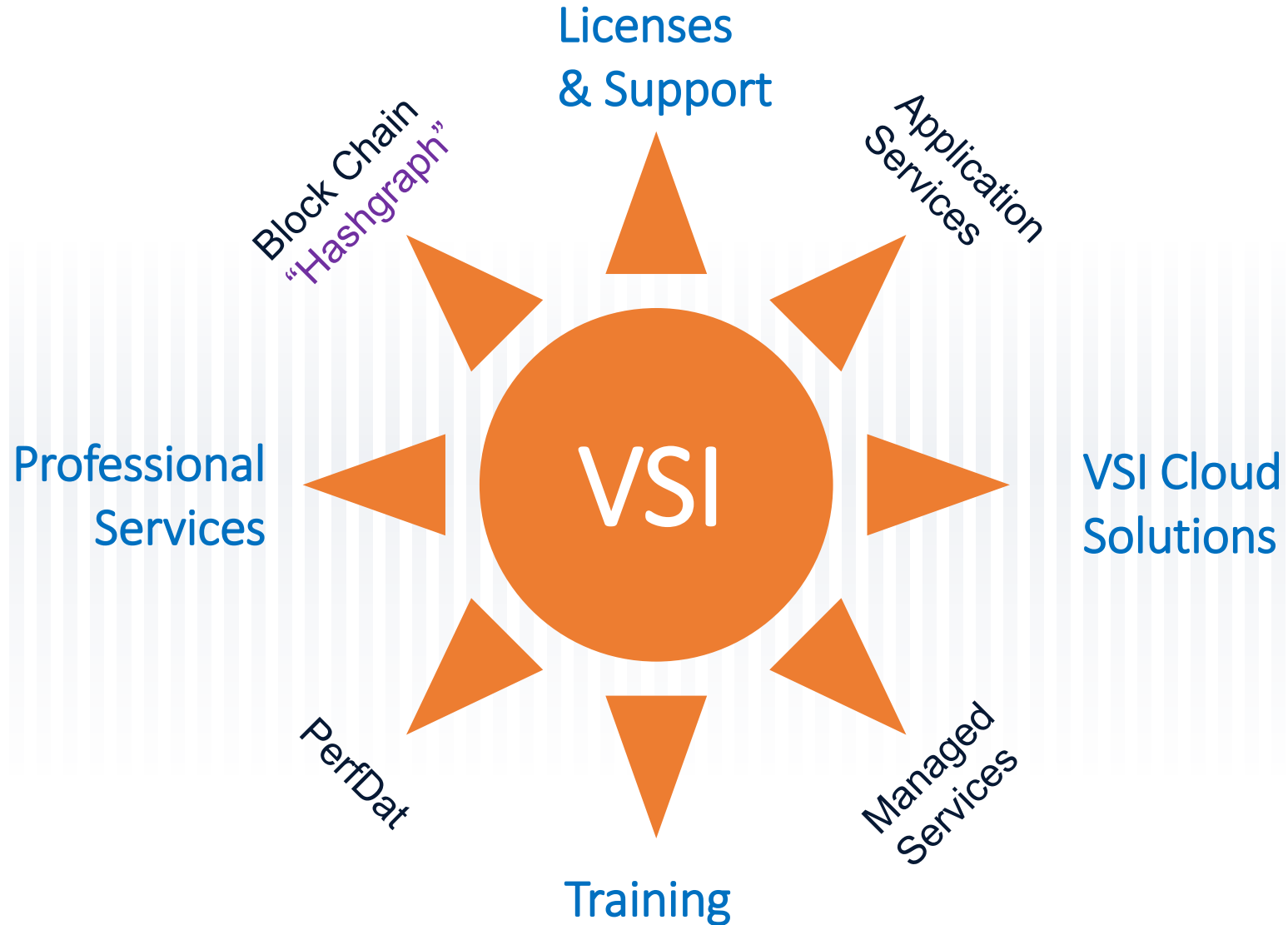
Who is VMS Software?

- VMS Software, Inc. was created as a result of its parent company Teracloud, Ltd (European corporation) purchasing from HP in 2014, all Rights to the OpenVMS O/S.
- VSI is headquartered in Bolton, Massachusetts USA just 15 minutes from the original DEC headquarters.
- VSI has approx. 90 employees with the majority in Bolton, MA but other locations as well.
 - Offices in Malmo, Sweden
 - Locations in The Netherlands, France, Germany, UK, Russia and elsewhere in North America
- The majority of VSI's employees are developers and engineers working on new product solutions with the majority of these people working on x86 products available in late 2020.
- As the exclusive developer of new OpenVMS products only VSI can provide benefits that no one else can including....

Rights To New Versions (RTNV)



OpenVMS Clearinghouse



VSI Professional Services

Installation &
Migration Services

Managed Services

Remote Monitoring

Application
Modernization



How is VMS Software doing?

- Backed by Teracloud Corporation parent.
- In both 2017 and 2018 our Booked Orders increased at least 2X compared with the previous year.
- Positive EBITDA projected in 2019
- Focus is the CUSTOMER
 - Customer transition underway
 - Different ways to work with VSI.
 - Need to Accelerate the transition
- Adding VSI Resources
 - Engineering
 - Professional Services
 - Sales Team





OpenVMS

Rolling Roadmap

January 21, 2019

VSI Improvements to OpenVMS

Licenses



6
versions

48 months

764
Defect Repairs

195
New Features

16
Open Source
Releases

102
ISV Partners

65
Layered Products

2
Platforms ^{SEP}
(IA64 & Alpha)

VSI OpenVMS Rolling Roadmap

2019

Q1

SAMBA

New HPE StoreOnce Models

P441 SAS RAID Controller (12Gb SAS)

Enhanced Password Management

Q2

OpenVMS V9.0 x86-64 Early Adopters Kit

- Selected ISVs, Partners & Customers
- New Licensing
- Selected HPE Servers
- Graphical Boot Manager
- Virtual Machine guest option – Oracle VM VirtualBox
- VSI TCP/IP
- Compilers – C, FORTRAN, Pascal, COBOL, BASIC, BLISS, XMACRO
- Compile/link on IA64, run/debug on x86
- Select Layered Products

CRTL/C99 updates for IA64, Alpha

OpenVMS V8.4-2L1 Integrity Update Kit

Q4

OpenVMS V9.1 (x86-64 General Early Adopters Kit)

- Available to All ISVs, Partners & Customers
- Additional Layered Products
- Additional Compilers - C++
- Additional Open Source Applications
- Additional Virtual Machine guest options - kvm
- Native build tools - compile/link on x86

2020

OpenVMS V9.2

Production Release – x86-64, Itanium

- Full Production Release
- Security
 - Signed OS executables
 - Stronger Password Encryption
 - OpenSSL V1.1.1x
- Additional HPE & Dell Servers
- Improved Network Performance
- OpenJDK
- Compilers - C, FORTRAN, Pascal, COBOL, BASIC, BLISS, XMACRO, C++
- Standards updates on 9.2/x86:
 - C
 - C++
 - FORTRAN

2021

OpenVMS V9.2

Production Release –Alpha

Similar software features on Alpha V9.2 as on x86 and IA64 with exceptions:

- No OpenJDK on Alpha
- Existing IO options on Alpha
- Alpha compiler front ends will not be updated

Based on current, best estimates. Subject to change without notice.

x86 Server/IO Roadmap

	<u>OpenVMS V9.0 EAK</u>	<u>OpenVMS V9.1 EAK</u>	<u>OpenVMS V9.2</u>	
Server Models	<u>HPE servers</u> DL20, DL380, DL580 ML30	<u>HPE servers</u> DL20, DL380, DL580 ML30	<u>HPE servers</u> DL20, DL380, DL580 ML30 Blades – investigating	<u>Dell servers</u> Cloud, Modular, Rack, Tower – models TBD Blades – investigating
VM Hypervisor	Oracle VM VirtualBox	Oracle VM VirtualBox, KVM	Oracle VM VirtualBox, KVM	
SmartArray/RAID/HBA	P408	P408, P816, P824	P408, P816, P824 Dell Perc - investigating	
Fibre Channel	Qlogic 26601/2 - 16Gb single, dual port	Qlogic 26601/2 - 16Gb single, dual port	Qlogic 26601/2 - 16Gb single, dual port Emulex LPe16001/2 – 16Gb single, dual port (investigating)	
NIC	1 Gb – Intel I350, BCOM 5719 FlexLOM and add-in cards	1 Gb – Intel I350, BCOM 5719 FlexLOM and add-in cards 10 Gb – Intel XL710, X550	1 Gb – Intel I350, BCOM 5719 FlexLOM and add-in cards 10 Gb – Intel XL710, X550	
USB	USB 2.0	USB 3.1	USB 3.1	

Notes

- VSI will test specific models in a server product line and will support architecturally equivalent server models (same CPU/chipset family)
- VSI will work with customers for specific server model support if not listed above
- IO card support will be a subset of what is available on x86 Windows/Linux servers
- USB device support will be for server oriented memory devices such as memory sticks and mass storage drives

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OpenVMS Integrity Operating Environment

Released		Planned
BOE Components:		BOE Components
<ul style="list-style-type: none"> • V8.4-2L1 operating system • ANT V1.7-1B • AXIS2 VB1.0-1 • CDSA V2.4-322A • CIFS V1.2ECO1A • CSWS V2.4-3G • CSWS_JAVA V8.5-4 • CSWS_PHP V5.2-17A • DCPS V2.8 • DECnet Phase IV V8.4-2L1 • DECnet Phase V V8.4I • DECram V8.4-2L1 • DECwindows Motif V1.7E • DCE (runtime) V3.2A • ENCRYPT V8.4-2L1 • Enterprise Directory V5.8 • Kerberos V3.2-260 • GNV V3.0-2 	<ul style="list-style-type: none"> • NOTARY V1.0 • OpenSSL V1.02k • PERL V5.20-2A • TCP/IP V5.7-13ECO5F • The Data Collector V2.3-1220A • UDDI V1.0B • VSI Binary Checker V1.2 • WBEM/CIM V3.0-B151019 • WBEM providers V2.2-5D • WSIT 3.4-1 • XML C++ 3.0-1-1 • XML_JAVA V4.0-1 	<ul style="list-style-type: none"> • Availability Manager Base V8.4-2L1 • RMS Journaling V8.4-2L1 • Volume Shadowing V8.4-2L1 • OpenVMS Cluster Client V8.4-2L1 • OpenVMS Cluster Software V8.4-2L1 • RTR V5.3
		<ul style="list-style-type: none"> • CSWS additional modules • GNV Updates • SAMBA (CIFS) 4.6.5 • OpenSSL V1.1.x

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OpenVMS Integrity Layered Products

Released		Planned
<ul style="list-style-type: none">• ABS / MDMS V4.6• ACMS dev, remote, runtime V5.2• BASIC V1.8-4• C V7.4-1• C++ V7.4-6• COBOL V3.1-7• Datatrieve V7.4-1• DECforms dev, runtime V4.2• DECset V12.9-1 (CMS, DTM, MMS, SCA, LSE, PCA)• DFO V3.3• DEC DFS V2.5• FMS dev, runtime V2.6• FORTRAN V8.3-3	<ul style="list-style-type: none">• Japanese VMS<ul style="list-style-type: none">- DECforms V4.2- DCPS V2.8- FMS V2.6- DECwindows Motif V1.7E• MRU V1.9• PASCAL V6.2• SSM V1.9-1• TDMS dev, runtime V2.1-1• T4 V4.4D• OMNI / OSAP• DQS V1.4• GKS V7.3• OMNI V4.1• OSAP V4.1• X.25	<ul style="list-style-type: none">• C updates for C99

OpenVMS Alpha – OS & Layered Products

Released			Planned
<ul style="list-style-type: none"> • V8.4-2L1/V8.4-2L2 OS • CDSA V2.4-320A • DCPS V2.8-1 • DECnet Phase IV V8.4-2L1 • DECnet Phase V V8.4D • DECram V8.4-2L1 • DECwindows Motif V1.7F • DCE (runtime) V3.2B • ENCRYPT V8.4-2L1 • Enterprise Directory V5.8-2 • Kerberos V3.2-152B • DQS V1.4 • NOTARY V1.0 • OpenSSL V1.02KA • TCP/IP V5.7-13ECO5F • The Data Collector V2.3-1220 • VSI Binary Checker V1.1A • AM Base V8.4-2L1 	<ul style="list-style-type: none"> • RMS Journaling V8.4-2L2 • Volume Shadowing V8.4-2L2 • OpenVMS Cluster Client V8.4-2L2 • OpenVMS Cluster Software V8.4-2L2 • RTR V5.4-1 • T4 V4.4D • ABS / MDMS V4.6-1 • ACMS dev, remote, runtime V5.3 • BASIC V1.8-5 • C V7.4-1 • C++ V7.4-8 • COBOL V3.1-7 • Datatrieve V7.4-1 • DECforms dev, runtime V4.2-1 • DECset V12.9-3 (CMS, DTM, MMS, SCA, LSE, PCA) • DFO V3.3-1 • DEC DFS V2.5-1 	<ul style="list-style-type: none"> • FMS dev, runtime V2.6-1 • FORTRAN V8.3-3 • MRU V1.9-1 • PASCAL V6.2-125 • SSM V1.9-1-2 • TDMS dev, runtime V2.1-2 • AM Base V8.4-2L1 • AM Data Analyzer V3.2 • GKS V7.3 • OMNI V4.1 • OSAP V4.1 • X.25 	<ul style="list-style-type: none"> • OpenSSL V1.1.x

OpenVMS Integrity Open Source Products

Available	Investigating
<ul style="list-style-type: none">• ActiveMQ V5.15.0A• cURL & libcurl V7.49.0A (OpenSSL 1.0.2h support)• Lua V5.2.3• Mosquitto V1.4.14 (MQTT broker)• Paho-C V1.2.0 (MQTT client)• PHP V5.6.10B• Ruby V2.2.2I• SCALA V2.11.8• Subversion V1.8-13• SWIG V3.0.5• Vgit2 V0.8.5• ZeroMQ V4.1.2• gSOAP V2.8.32• GNUplot V5.0-2• Maven V3.3-9• Syslog• Redis 4.0.0• PDF Viewer• Gearman 1.1.17• HAProxy 1.7.9• LibMariaDB 2.1.0 (MariaDB and MySQL client API)	<ul style="list-style-type: none">• Precision Time Protocol (PTP)• Erlang• Several Others Being Reviewed• SAMBA (CIFS) 4.6.5 (in progress)• PostgreSQL client• New IDE based on Visual Studio Code

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OpenVMS Alpha Open Source Products

Available	Coming Soon	Investigating
<ul style="list-style-type: none">• CIFS V1.2ECO1C• CSWS V2.4-3O• CSWS_JAVA V6.0-47A• Mosquito 1.4.14 (MQTT broker)• Paho-C 1.2.0 (MQTT client)• Redis 4.0.0	<ul style="list-style-type: none">• SAMBA 4.6.5	<ul style="list-style-type: none">• ZeroMQ 4.1-2• Redis 4.0.0 (beta available)• New IDE based on Visual Studio Code

Prior VSI OpenVMS Releases

May 2015

March 2016

August 2016

2017

2018

OpenVMS V8.4-1H1

Itanium® Processor 9500 series

- New CPU architecture
- Vastly improved performance

HP Integrity System Support

- rx2800
- HP Integrity Server Blades
 - BL860c
 - BL870c
 - BL890c
- Blades FlexFabric LAN support
- 9300 series blades and rx2800

Software

- Quality Enhancements
 - Operating System
 - Layered Products
- Product Rebranding

OpenVMS V8.4-2

HPE Integrity System Support

- Full BL890c Support
 - 64 Cores (hyperthreads off)
 - 1.5 TB Memory
- AUTOGEN (large memory)
- UEFI 2.3
- Network Boot for i4 Blades
- WBEM for i4
- rx7640 / rx8640

Performance

- More alignment faults eliminated
- Tunable BACKUP Compression

Software Component Updates

- Enterprise Directory 5.7
- CSWS (based on Apache 2.4.12)
- LDDRIVER 9.7
- Latest Time Zone Definitions
- I18N (for localized language support)
- Digital Signing 2.0
- Rebranding 2.0

OpenVMS V8.4-2L1

Limited Software Release

- Updated SSL to 1.0.2h
- Updated key exchanges
- 0.9.8/1.0.2 coexistence mechanism
- VSI and HPE libraries and shareable images are compatible
- 0.9.8 no longer supported

SSL-Related Capabilities

- Updated for compatibility with 1.0.2: TCP/IP, ENCRYPT, NOTARY, LDAP, ACMELDAP, Enterprise Directory, WBEM services, WBEM providers, CSWS

Patch Kits

- Includes contents of patch kits issued through June 15, 2016

Q1

- Alpha V8.4-2L1 OS
- Itanium
 - JAVA 1.8
 - Digital Signing for ISVs
 - OpenSSL 1.0.2j

Q2

- Alpha Layered Products
- Alpha V8.4-2L2 OS
- OpenSSL 1.0.2k

Q4

- 16Gb Fibre Channel for rx2800
- Itanium i6 Support Announced

Q1

LTO-8 Tape

Q2

OMNI
OSAP
GKS
DQS

Q3

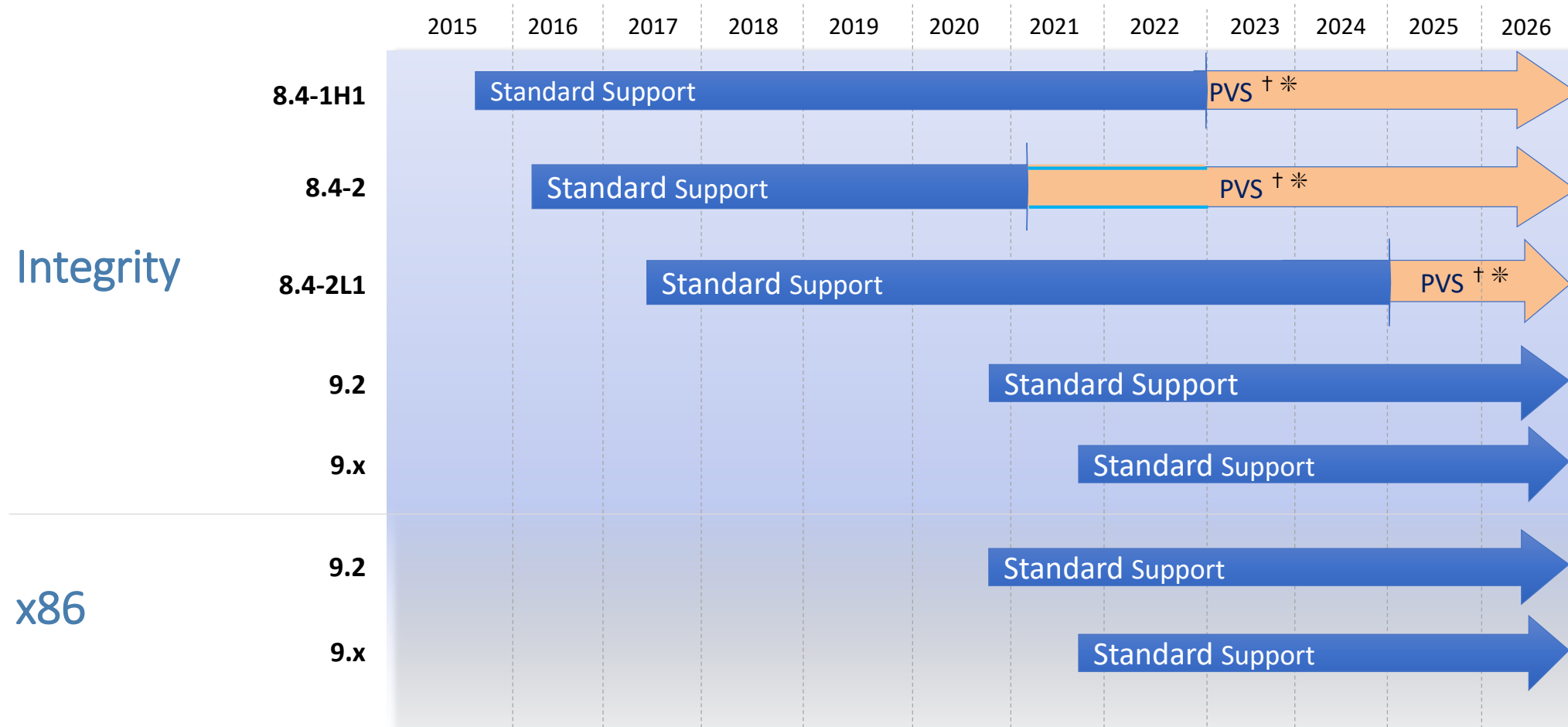
VSI TCP/IP V10.5

Q4

JAVA 8 Update
HPE MSA2050
support
3PAR FW V3.3.1

VSI Support Roadmap

VSI OpenVMS Integrity & x86 Support Roadmap



5 Year Standard Support + 2 Year PVS minimum

[†] PVS – Prior Version Support without Sustaining Engineering

24 Month notice will be provided before support is ended

^{*} Extended Engineering Support (EES) contract is available

VSI Support Offerings - Integrity

Bronze 9X5 Support

- Standard support phone number provided
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 9 hours a day, during 5 business days a week
- Provided periodic VSI updates
- 4 hour response from initial customer contact. This assumes that the customer uses the standard support phone line provided to the customer by VSI.

Silver 24X7 Support

- Standard support phone number provided
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 24 hours a day, 7 days a week
- Provided periodic VSI updates
- 2 hour response from initial customer contact. This assumes that the customer uses the standard support phone line provided to the customer by VSI.

Gold 24X7 Support

- Standard support phone number provided
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 24 hours a day, 7 days a week
- Assigned a remote Technical Account Manager (TAM)
- VSI software patch analysis
- VSI software system health checks
- Provided periodic VSI updates
- 1 hour response from initial customer contact. This assumes that the customer uses the standard support phone line provided to the customer by VSI.

Platinum 24x7 Support

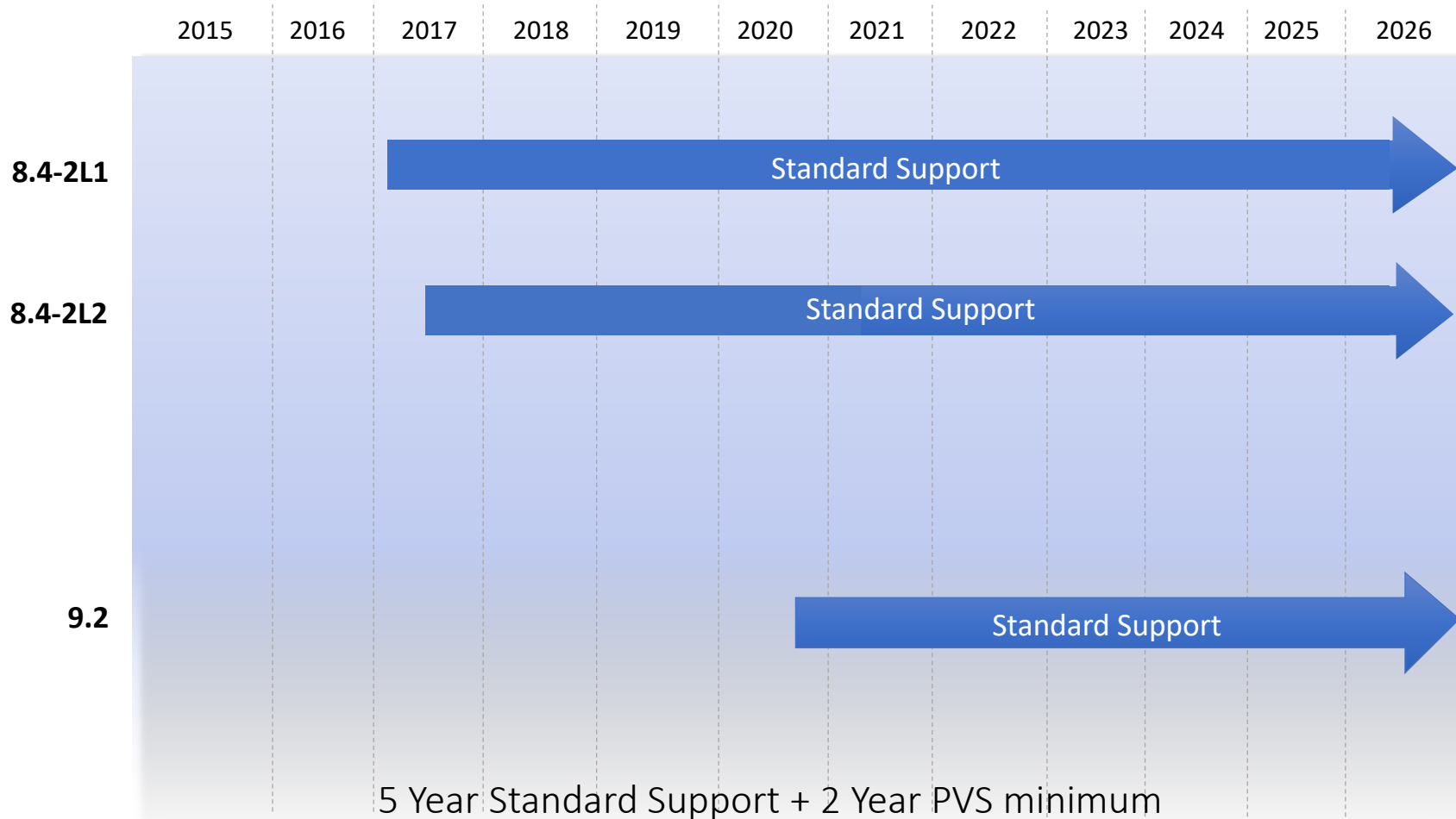
- Dedicated phone number provided on sign-up
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 24 hours a day, 7 days a week
- Assigned a remote Technical Account Manager (TAM)
- Quarterly VSI software patch analysis
- Quarterly VSI software system health checks
- Provided periodic VSI updates
- Immediate response from initial customer contact. This assumes that the customer uses the dedicated phone line provided to the customer by VSI.



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VSI OpenVMS Alpha Support Roadmap

Alpha



- 24 Month notice will be provided before support is ended
- PVS – Prior Version Support without Sustaining Engineering will be provided at that time (EES contract also available)

VSI Support Offerings – VSI OpenVMS Alpha

Bronze 9X5 Support

- Standard support phone number provided
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 9 hours a day, during 5 business days a week
- Provided periodic VSI updates
- 4 hour response from initial customer contact. This assumes that the customer uses the standard support phone line provided to the customer by VSI.



Silver 24X7 Support

- Standard support phone number provided
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 24 hours a day, 7 days a week
- Provided periodic VSI updates
- 2 hour response from initial customer contact. This assumes that the customer uses the standard support phone line provided to the customer by VSI.



Platinum 24x7 Support

- Dedicated phone number provided on sign-up
- ¹ Right to New Versions (RTNV) of a VSI product
- Access to all software updates/patches provided between numbered releases
- Technical Support 24 hours a day, 7 days a week
- Assigned a remote Technical Account Manager (TAM)
- Quarterly VSI software patch analysis
- Quarterly VSI software system health checks
- Provided periodic VSI updates
- Immediate response from initial customer contact. This assumes that the customer uses the dedicated phone line provided to the customer by VSI.



New VSI Products

VSI New Products

- TCP/IP V10.5
 - Replacing the existing OpenVMS TCP/IP stack with a completely updated stack based on software licensed from Process Software
 - Is currently released as a standalone EAK (Early Adopters Kit) on Integrity
 - Will be the only stack on x86
- Password Management
 - Increases password security on OpenVMS
 - Available on Integrity and Alpha
 - Standard with all new VSI license releases
 - Available now

VSI New Products cntd.....

- **PerfDat**

- VSI purchased from HPE in January, 2019
- An integrated performance monitoring, management and capacity planning solution for OpenVMS
- Available as a stand alone product for your OpenVMS environment
- Available as a VSI Professional Service offering

- **Service Control**

- Makes non cluster aware application highly available
- Reduces service recovery time
- Provides detailed information about the services, the resource they depend on and their inter-dependencies
- Services can be managed without expert know-how

Questions ?



Thank You

To learn more please contact us:

info@vmssoftware.com

+1.978.451.0110

www.vmssoftware.com