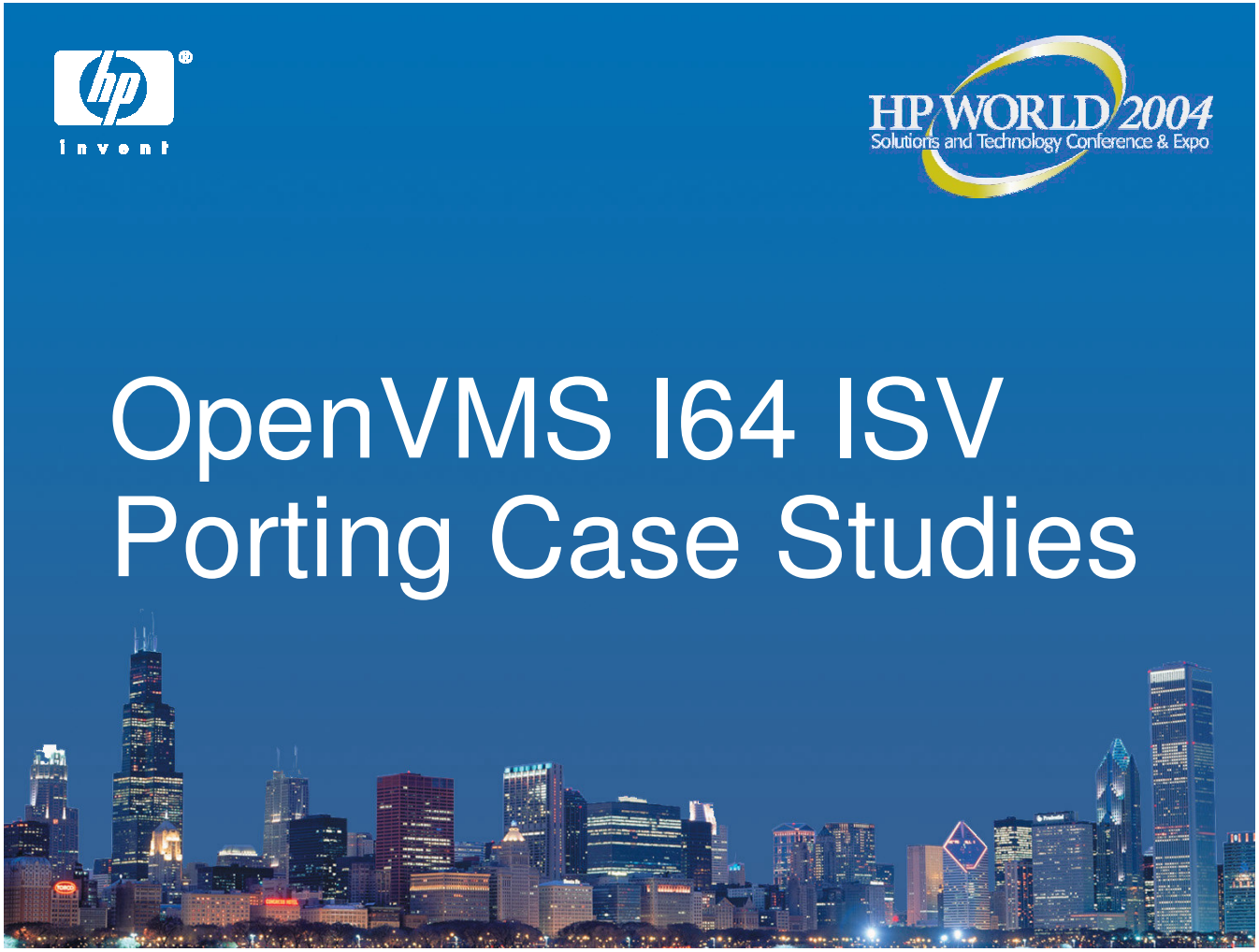


OpenVMS I64 ISV Porting Case Studies

John C. Egolf

OpenVMS Itanium ISV Porting Program Manager
Hewlett-Packard

Topics

- Status / overview of progress
- Overview of OpenVMS partner programs and initiatives
- Porting case studies and examples:
  - Typical OpenVMS software application port from Alpha to Itanium from a software partner's perspective.

HP OpenVMS I64 port status exceeding expectations

OpenVMS v8.2 Production Release
(AlphaServer & Integrity) 2004H2

★**OpenVMS v8.1 Evaluation Release**
December 2003

1st & 2nd ISV Applications Ported
August 2003

OpenVMS v8.0 in DSPP labs
August 2003

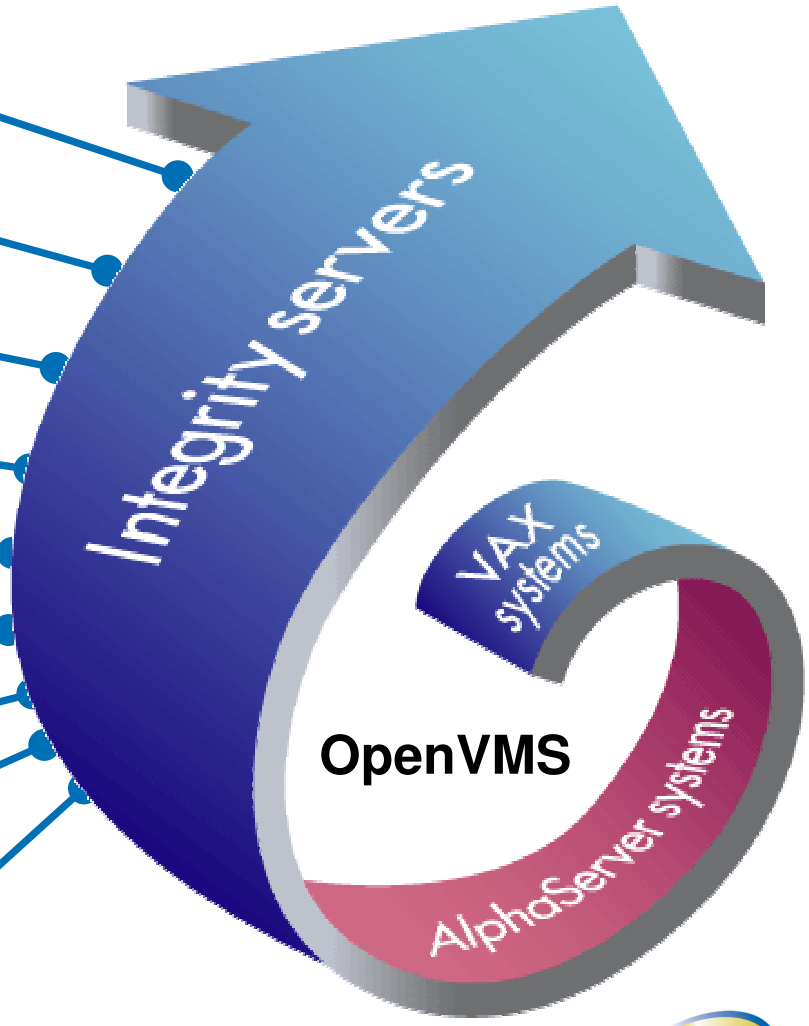
4 Processor System Boot
July 2, 2003

★**OpenVMS v8.0 Evaluation Release**
June 30, 2003

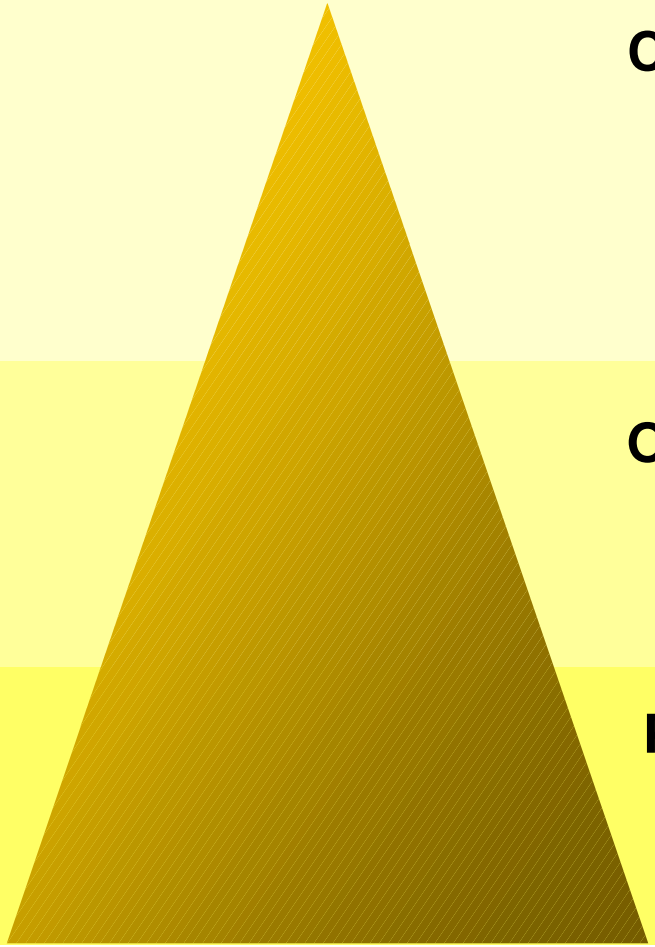
1st Application Port & Mixed Cluster
May 15, 2003

Boot to rx 2600 server
March 17, 2003

1st boot to Itanium® system
January 31, 2003



Partner definitions



Corporate Managed Accounts

- –HP Partner Managers
- –Examples: Oracle, Microsoft, Intel, etc.
- –Some partners support multiple platforms (eg. OpenVMS, HP-UX, Tru64 UNIX, NSK, Windows)

OpenVMS Vertical Segment Focus

- –Engineering-led business & technical support
- –Approx. 100 partners supported
- –Engagement model: 1 VSP mgr to few partners

Program-managed Partners (DSPP, etc.)

- –Approx. 3500 ISVs supported
- –Engagement model: 1 manager to many partners

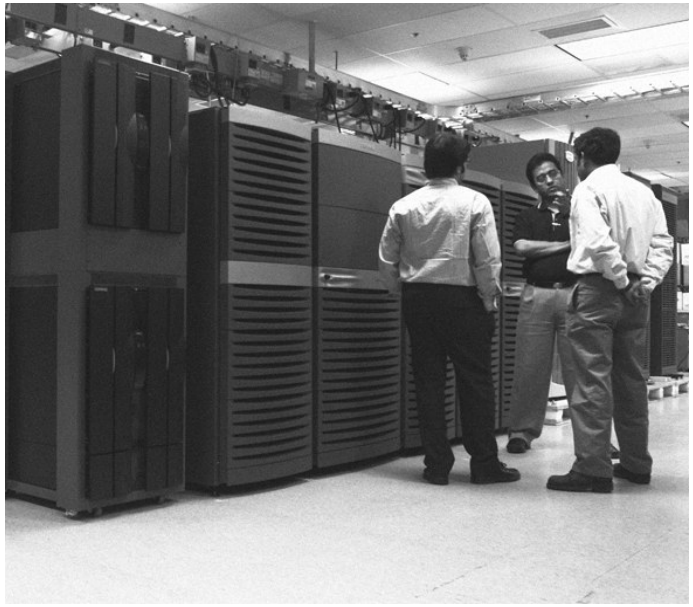
OpenVMS partner programs

- Focus on key enterprise class partners
- ***Move*** OpenVMS partner base to OpenVMS on Itanium®
  - ***FastTrack*** program
  - Supportive quotes from partners
  - Expand the program with additional partners
  - Ensure smooth introduction of Itanium® - based HP platforms, with partner engagement.
- ***Engage*** 'end users' to accelerate adoption of Itanium-based OpenVMS Systems.
- OpenVMS partner labs provide valuable partner support

Strengthen OpenVMS software application portfolio

OpenVMS Solutions Center

- Dedicated lab in Nashua, NH (ZKO1)
- Secure environment for partner/customer application evaluation and testing
- On-site technical assistance
- Hardware & software focuses:
  - New hardware
  - Latest versions of OpenVMS
  - Third-party e-business software
  - Vertical segment solutions



OpenVMS software partner status

- Strong partner commitments to support OpenVMS
- 80+% of “program-managed” partners already have plans to port to OpenVMS on Itanium (More than 100 solutions already ported)
- Key partner support for database, middleware, and system management applications.

OpenVMS partners supporting the port, just to name a few…

SchlumbergerSema

bea

IDX

MONTRAN

bmcsoftware

IONA
Total Business Integration

COMPUWARE

ACUCORP

SANCHEZ

ARGENT

PROCESS SOFTWARE

ALSTOM

BROOKS AUTOMATION

MVP SYSTEMS

CERNER

InterSystems CACHÉ Post-Relational Database

ATTUNITY

ca

SYNERGEX®
Extending Enterprise Applications

CODA
FINANCIAL INTELLIGENCE

ROLFE & NOLAN

POINT SECURE

GIFTS Software Inc.

Ada Core TECHNOLOGIES.INC

ERICOM SOFTWARE

ORACLE

Deutsche Börse Systems

ISE INC.

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Overall status of OpenVMS I64 partner support

Synergex, 2AB, Inc., ACUCORP, Inc., Acxiom Corporation, ADL Data Systems Inc., ADMINS Inc., Advanced Systems Concepts, Inc., Albany Software Ltd., ALI Database Consultants, Alpaje, Amzi! inc., Applied Information Systems, Inc., Appmind Software AB, APT Management Solutions, Pty Ltd, Arcadd Enterprises, Aster, Attunity Inc., bChat Pty Ltd, BetaData Systems, Inc., BIOS, Software GmbH, BMC Software, Inc., BMS Computer Solutions Limited, BookMine/PageWeavers, Bormuth Associates, Bradly Associates Ltd., BridgeHead Software Ltd., Brooks Automation,, Inc., CAIL, CA[illegible]on, Cincom Systems, Inc., Circle Software Group, B.V., Cleanscape Software International, Columbia [illegible] Services, Computer Associates International, Inc., Computer Communications Limited, Computer, Corporation of America, Computershare Limited, Compuware Corporation, COMTEK Services,, Inc., CONNX Solutions, Inc., Consolidated Data, Inc., Corporate Microsystems Limited (CML), Courion Corporation, CRISP Automation Systems, Cristal Software, Cyrano, Inc., Data Center, Software, Inc., Data Life Associates, Data Processing Engineering S.R.L., Deutsche Bourse, [illegible], Digiflex Information Systems, Inc., Digital GlobalSoft Limited, Digital Information, Systems, Digital Networks, Distribution Ma[illegible] DS Data Systems S.p.A., DTRO Inc., Dymaxion Research Limited, edisolve.com, inc., EDS Information Business GmbH, EDS Software Engineering and Products, (SWEP), Eiger Systems Limited, Envoy Technologies, Inc., Ergonomic Solutions, Ericom, Software, Inc., eSignal, a division of Interactive Data Corporation (formerly Data Broadcasting, Corp.), EssNet AB, Eyelit Incorporated, Faxport Inc., Financial Accounting Systems, Inc., Financial Models Company Inc., FORTEL Inc., GENEOUS SOFTWARE AG, Genetek Earth, Research Corporation, Geometric Solutions Inc., Global Informatica S.r.l., Gray[illegible] Inc., GUS Group AG & Co KG, Heroix Corporation, Hirschmann Consulting AG, IBM United [illegible] Corporation, IDX Systems Corporation, Imperial Technology, Inc., IMSure Network, Inc., Industrial Process, Support Services Inc., Infomedia Ltd., Business Systems Division, Information Resource, Products, Inc., Intralot S.A., IPESOFT Ltd., ipTEST Limited, ISE Inc., ISIDATA GmbH, ITHEON, Ltd, JFA Systems, Ltd., Johnson Aeronautics, Kaycee Software, Inc., Legacy Technologies 2000, Leica Microsystems Lithography Ltd., LIWACOM Informationstechnik GmbH, LUTE[illegible]oration, Mannesmann Forschungsinstitut GmbH, (formerly Mannesmannro[illegible]sociates,, Inc.), Max-Planck-Institut fuer Immunbiologie, MegaSys Computer Technologies, Migration, Specialties International, MQSoftware, Inc., MVP Systems, Inc., National Distributor Systems, Inc., (NDS), Network Catalyst, Networking Dynamics Corporation, New York University Medical, Center, Noack & Partner, ONE Tec AG, Opus One, Oracle Corporation, Orsyp S.A., PARSEC, Group, Inc., (The), PDV-SYSTEME GmbH, Pinnacle Solutions Incorporated, Point Secure, Inc., [illegible]PLUS, Inc., Premier Software Systems, Inc., Probe, automatisering, proGIS Software, Proprie[illegible]adley, Corporation, Recital Corporation, Redwood Software Nederland B.V., Savant Technologies, Inc., SBPA Systems, Inc., SchlumbergerSema Finance (Capital Markets), SchlumbergerSema, Telecom (formerly Sema Telecoms), SCJ Consulting, Inc., SHD Datentechnik GmbH, Shell, Global Solutions International B.V., Sigma Systems, Inc., SIMCO, SoftLink Ltd., Softsys OY, Software AG, Software Partners, Inc., Software Resources International, Spokane Computer, Incorporated, SPS Gensys Solutions BV, STABILIT Informatik AG, Storage Solutions Specialists, Inc., Swiftbase International [illegible] Technologies Ltd, TECSys Development, LP (TDI), [illegible] (formerly Mimer Infomation Technology AB), VAI, Industries Ltd., VCS Aktiengesselschaft, Vista Control Systems, Inc., Viveo Cognitive Systems, (formerly Logos-CSE sa/nv), Whisper Technology Limited, X9000, XLNsystems, Inc., Xora, Inc., XuiS Software Ltd., Yartoo Software Pty Ltd.

More than 695+ applications from 318+ partners are planned for port to OpenVMS I64; more coming every week

OpenVMS ISV Port Status

ISVs who have completed the port:

Horizontals

TECSys Development, Inc., MVP Systems, Acucorp, Attunity, BEA (MessageQ), Kermit,MySQL, Heroix, 2AB, Itheon, Computer Associates Unicenter Console Mgr.)

Verticals

Manufacturing – Brooks Automation, CADture , Retail – KAYCEE Software

ISVs with port in progress:

Horizontals

Oracle Rdb, Netricks, Ross Systems, Synergex, TIBCO (RV), Software AG, Legato, Process Software, EMC, IDX, InterSystems, Ericom, IBM (MQseries)

Verticals

–Health Care - Cerner Corporation, Telco – LogicaCMG, Martin Group

ISVs expected to start this quarter:

Appmind, CompuWare, IBI (Info Builders), SCT, Computer Associates (Ingres), ISE, SEMA, PointSecure, BEA (WLS)

Categorization of some Partner's who are porting…

- Databases
  - Open Source MySQL
  - Oracle Rdb
  - CA Ingres
  - InterSystems Cache'
  - Software AG ADABAS
  - Upright Mimer
- Messaging
  - BEA MessageQ
  - TIBCO RV
  - IBM MQseries
- System Tools
  - TDi ConsoleWorks
  - MVP JAMS
  - Attunity
  - Heroix EQ
  - Kermit
  - Samba
- Development Tools
  - Acucorp ACUCOBOL
  - Synergex Synergy/DE
  - 2AB

Opportunities with CA's Ingres

- CA has been strongly supportive of Ingres on OpenVMS I64
- Committed to being there when I64 V8.2 ships
- Ingres is now **Open Source**
  - CA will continue to invest / extend Ingres
  - CA will support Ingres
- Ingres supports clustering ala Oracle RAC
- Strong commitment to:
  - Do performance benchmarking on OpenVMS
  - Create tools to ease migration to Ingres from other DBs
  - Do whatever it takes to support us and our customers

Synergex's initial release of Synergy/DE on OpenVMS I64

http://www.synergex.com/solutions/openvms.asp

OpenVMS I64 Early Adopter Strategy

- OpenVMS I64 V8.0 – Cross Development
  - Work with key strategic ‘enabler’ partners who do not have requirements for yet-to-be-delivered components vs. end users.
  - Select a small number of partners so that quality support can be given in a 1x1 engineer to partner mode
  - Learn as much as possible as quickly as possible, feed information back to engineering and prepare others for porting experience
  - Be in a position to be more aggressive with V8.1 release and have hardware / software / processes in place to enable a larger supported group of horizontal and vertical partners on board

OpenVMS I64 Early Adopter Strategy

- OpenVMS I64 V8.1 – Native Development
  - Move existing V8.0 partners to V8.1 quickly
  - Select a larger number of partners to better shake out system and provide key enablers
  - Learn as much as possible as quickly as possible, feed information back to engineering and prepare others for porting experience
- OpenVMS V8.2 – Production quality release
  - Move all partners to V8.2 FT when available
  - Add additional partners
  - Ensure key solutions and enablers are ready when V8.2 ships later this year.

OpenVMS Itanium®-based *FastTrack* program

Objectives:

- **Early validation** of base operating systems and HP layered products
- **Early characterization** of ISV / customer porting effort
- **Early references,** experiences and success stories
- Key partner applications available at production release of OpenVMS on Itanium!

Plan:

- 5 vertical ISV applications
- HP supplied engineering resources and equipment
- Ready for porting to begin on day-one of OpenVMS Itanium kit availability

Current Status:

- More than 70 partners actively participating

Case Studies
Brooks Automation - PROMIS

- Application
  - Semiconductor FAB Manufacturing Execution System
- Source environment
  - ~3 Million lines Fortran
  - Small amounts of C
- Third Party dependencies
  - Oracle Database (Optional)
  - Messaging (Optional)
    - TIBCO RV
    - BEA MessageQ

Case Studies
Brooks Automation - PROMIS

- Lessons Learned
  - Fortran 77 and Fortran 90 compiler (on Alpha) have minor differences
  - Checking for “architecture” was not consistent
  - Cross compilers have some headaches that native compilers allowed us to breeze right through
  - Build and regression testing is very manually intensive (eyeball scan / human intervention required)
  - Approximately 100 lines of code changed out of 3M

Case Studies
Cerner Corporation - Millennium

- Application
  - Millennium is a revolutionary application platform that fulfills departmental needs while unifying complex, enterprise-wide workflows. It places the individual at the core of a complete, centralized electronic medical record, creating the foundation for streamlining communication and reducing risk.
- Source environment
  - 2.5 Million lines of C/ C++ source code
  - 6.5 Million lines of CCL (Cerner Command Language)
  - 1000 lines of Macro32
- Third Party dependencies
  - Oracle Database
  - IBM MQseries messaging

Case Studies
Cerner Corporation - Millennium

- Lessons learned
  - C++ compiler is in process of maturing
    - Initial C++ cross compiler didn't handle
      - VAX float datatypes (yet)
      - Exception handling
      - Template support
  - Had to move the UCX$INETDEF.H and TCPIP$INETDEF.H to the IA64$LIBRARY
  - TRACE utility not present (yet)
- Current status:
  - Native C++ compiler and development environment running smoothly.
  - Approximately 75 lines of code changed out of 2.5M*

*Note: HNMA not executable until Oracle is available

Case Studies
Open Source - MySQL

- Application
  - Database
- Source environment
  - 800 modules / 400,000 lines of C/ C++ source code
- Dependencies
  - OpenSSL
  - Zlib, a compression/decompression library

Case Studies
Open Source - MySQL

- Lessons learned
  - C++ cross compiler not complete and not mature
  - some 'posix compliant' C compiler changes (pthreads.h no longer includes ints.h on OVMS)
  - sigwait now provided by OVMS C RTL
  - Need better documentation for OpenVMS build / usage
- Current Status
  - Native C++ compiler working much better
  - Full port completed in February 2004
  - 10 lines of code changed out of 400K

Case Studies
Open Source - Kermit

- Application
  - File transfer / protocol
- Source environment
  - 300,000 lines of C source code
- Dependencies
  - none

Case Studies
Open Source - Kermit

- Lessons learned
  - Kermit was designed to be highly portable
  - Platform-dependent modules were coded to test for VAX or Alpha and to give up if neither. So all such tests had to be expanded to include IA64. Header files changed to appropriate compile-time symbol (_ia64)
  - Added code to the (DCL) build procedure to detect VMS 8.x and pass this along to the code (currently used only for runtime diagnostics).
  - Had trouble with lib$cvtf_from_internal_time(), needed to compile using / FLOAT=G_FLOAT or Unix gettimeofday() API
  - 10 lines of code changed out of 300K

HP and Intel Developer Forum

- Combination of lecture / hands-on labs
- Goal is to have ISVs get appropriate support and accelerate the port of their solution(s)
- Tracks on OpenVMS, HP-UX, Linux, and Windows
- First North American Forum – Bedford MA
  - 20 people attended for OpenVMS Track
  - 5 ISVs completed their port at the workshop
  - Everybody made significantly more progress than they expected
- Forums planned for Santa Clara, Phoenix, and Toronto

Overall Lessons Learned

- OpenVMS I64 is looking good on Itanium!
- The V8.1 native development environment is easier for partners to use vs V8.0 cross environment
- Most applications would port VERY easily and quickly once the OpenVMS bugs are squashed

Top 10 Porting Considerations…

1. Make sure your application builds cleanly and runs on OpenVMS V7.3-1 (or V7.3-2) using the latest released compilers and development tools
2. Do a complete inventory of all 3rd party software products and HP OpenVMS layered products before you start your port. These may be required for development, QA, or production deployment. Ensure you know the status of each of these on OpenVMS I64 before you go too far in your port.
3. Check for hardware architecture consistently in all source code and DCL command procedures
4. Have automated regression tests as much as possible and clearly documented manual regression tests where necessary
5. Document your build procedure / process
6. Read the Porting Guide and various Release Notes (Really do it!)
7. Update any Fortran 77 code to Fortran 90
8. Reduce / Recode / eliminate any Alpha Macro (Macro64 code) and PL/I
9. Where possible, use IEEE floating point
10. Have a working development / QA environment on OpenVMS Alpha near by so you can compare results easily between Alpha and Integrity systems.
11. **Sit back and just... Re-compile, Re-Link, and run :-)**

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