



IBM Virtual Loaner Program

A no-cost remote-access solution to IBM servers, operating systems and middleware

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Abstract

Today, the independent software vendor (ISV) application-enablement process provided by IBM Systems and Technology Group typically requires one of the following scenarios to provide an ISV with access to IBM hardware:

- IBM provides loaner hardware systems to the ISV
- The ISV leases or purchases IBM hardware
- ISV personnel travels to IBM facilities
- ISVs use loaners remotely for limited-time engagements

This places a high fixed cost on either IBM (for outbound loaners) or the ISV (for leased or purchased hardware, or for travel), limiting the number of ISVs and applications that support IBM platforms. Further, most of IBM's existing in-bound and remote-access programs are designed for short-term, focused engagements, rather than long-term ongoing development projects. The reach and coverage of the current business models can be expanded with the introduction of the Virtual Loaner Program (VLP), a free-of-charge offering primarily targeting self-enablement of territory and geography ISVs that are not covered by current equipment programs.

By implementing *cloud computing* concepts, making efficient use of a shared, centrally managed pool of equipment, and using on-demand software to automate common systems management and provisioning tasks, VLP can scale to support thousands of ISV engagements per year at much lower costs than traditional outbound loaners, leases and inbound systems-access programs.

The VLP uses some of the latest IBM technologies to provide rich, flexible, and highly secure on-demand remote access to IBM servers for ISVs to develop, port, tune, test, certify, benchmark and support applications, minimizing or eliminating the need for ISVs to own or lease IBM servers or travel to IBM facilities. Key cloud computing technologies used by VLP include: automated systems provisioning, server, I/O and storage virtualization, and dynamic and proactive management.

VLP supports both long- and short-term usage models, so that it can serve as a long-term primary development or porting environment for some ISVs, whereas it serves as a short-term test or certification environment for others. The focus of the program is on IBM POWER® processor-based equipment running IBM AIX®, Linux® and IBM i operating systems and a limited set of IBM middleware, but the program also provides access to IBM System x™ and IBM BladeCenter® systems running Linux and Microsoft® Windows® through the IBM Innovation Centers.

Program overview

Available since May 2004, the Virtual Loaner Program allows ISVs to develop, test and validate their software applications on IBM hardware and middleware using highly secure, Web-based remote access.

This program marked a quantum leap from the previous system — in which ISVs tested their products on loaner hardware shipped to them by IBM — to one that operates under a 21st century on demand operating environment for ISVs. With VLP, IBM provides system access to thousands of ISVs instead of hundreds, and expands the reach of its equipment programs to small and medium business (SMB) ISVs and those in emerging geographies previously not well covered.

The VLP uses cloud computing technologies to provide a rich and flexible software development environment for remote-access use by ISVs. ISVs are able to reserve, in advance, resources in the “cloud” to satisfy their need for free-of-charge access to current IBM hardware and middleware to develop, port, test and validate their applications.



VLP is an infrastructure to enable an ISV to request a reservation, get real-time availability information, make the reservation and have the requested systems provisioned (cleaned, OS installed, configured) from the ground up with e-mails automatically sent to the ISVs informing them of log-on and usage information.

VLP also provides cost-free access to the IBM Software Access Catalog for AIX, Linux and IBM i engagements. The VLP Software Access Catalog is an entry point to the full IBM SAC, which contains current versions of hundreds of downloaded IBM software installation images. This feature allows VLP users to establish a robust development environment with IBM hardware, middleware along with any additional third-party software installed by the user.

The relative simplicity of the program for its users is one of the VLP's greatest assets. In fewer than two hours (15 minutes in most of the cases) of a committed request made any time of day or night from any location, an ISV can get connected and be fully operational on almost instantly provisioned logical partitions (LPARs). The ISV can connect through a virtual private network (VPN) client and begin porting, debugging, development, sizing, and testing before physical hardware could even be ordered. Prior to the end of the reservation, ISVs can save the image and, in a subsequent session, pick up exactly where they left off.

Increasing the reach and coverage of the ISV community

VLP has redefined the rules of remote access and gives the ISVs a rich and flexible infrastructure to get access to IBM hardware. This process that once took days and even weeks can now be accomplished in a matter of minutes. Even more compelling is that VLP allows the ISV to get access to the latest version of IBM hardware as soon as it becomes available internally, a feature that truly accelerates time to market for ISV software.

Perhaps the most important aspect of VLP is that it opens up a whole new realm of opportunity for ISVs by providing access to IBM hardware and middleware anytime from anywhere. VLP increases the reach and coverage of the ISV community and provides ISVs more rapid and flexible systems access, which can help decrease the time required to bring solutions to market.

It also makes more efficient use of IBM loaner equipment, increasing overall utilization and lowering the cost per ISV. That, in turn, enables IBM to support more ISVs with a fixed amount of resource. VLP allows IBM to give on-demand access to new ISVs and new ISV projects, increasing the number of applications available on IBM systems and overall partner satisfaction.

VLP is an on-demand transformation of one of the IBM Systems and Technology Group ISV organization's core business processes, which is to provide access to IBM servers, operating systems and middleware to ISVs so that they can enable their software applications on IBM software and hardware platforms. The VLP solution provides the potential for decreased ISV solution time to market by providing more rapid and flexible access. It also makes more efficient use of the IBM loaner equipment. In addition, the grid infrastructure can be extended to multiple sites, creating a common reservation system for worldwide ISV support resources.



Supporting more ISVs without investing in more resources

Seeking a high-efficiency, low-cost, automated mechanism to provide systems access to a larger number of ISVs, IBM chose a cloud computing approach rather than individual systems to capture what would be idle time with traditional loaner systems. IBM is increasing the overall utilization of its systems and lowering the cost per ISV, enabling it to support more ISVs with a fixed amount of resource. The primary benefits that VLP offers to the ISV are speed and flexibility. ISVs can make a VLP reservation, choosing the hardware configuration and operating system, and have full root access to their own custom-configured virtual server in a matter of minutes. ISVs also have greater flexibility than with conventional loaners — they can develop an application once, and then test it against multiple hardware, operating systems and software configurations.

IBM business and technology showcases

From a technology standpoint, VLP is a showcase for the cloud computing environment, integrating virtualization technologies (PowerVM Live Partition Mobility, dynamic logical partitioning [DLPAR], Virtual I/O Server (VIOS), IBM SAN Volume Controller technology and more), efficient management paradigms, like the IBM Tivoli® Monitoring, Tivoli Storage Manager and the MOAB Workload Manager grid scheduler (from Cluster Resources, Inc.) to create a true self-managing, self-service, remote-access development and test environment.

From a business standpoint, VLP is a showcase for cloud computing business-process transformation. Here, the emphasis is not on the technology, but on what new things the technology lets IBM do. The higher equipment utilization and lower cost of operation provided by the VLP on demand environment lets IBM do something new for the business, which is to expand the coverage of equipment programs, reaching a set of customers (in this case, SMB ISVs) who were difficult to reach using traditional ways of doing business.

Remote-access programs compared to the Virtual Loaner Program

The following table summarizes differences in key attributes between current remote-access programs and the Virtual Loaner Program.

Attribute	Existing remote access models	VLP model
Primary focus	High-touch hands-on access is primary focus, remote access secondary focus	Low-touch remote access only, no on-site hands-on access
Engagement model	Generally single one-week to one-month engagement, scheduled in advance; some use subscription model	Ongoing, long-term development resource; repeated half- and one-day login sessions, as needed
System and software provisioning	Systems tend to be hand-built for each engagement	Automated provisioning
Scheduling	Calendar-based manual scheduling	Automated matchmaking and scheduling
Dedicated mode	Individual systems dedicated to user for duration of engagement — ISV uses specific system or systems	Individual LPAR dedicated to one user only during active login — ISV uses “the cloud,” not specific systems
System Management:	Pool of individual systems	“Cloud” of resources
Fee Structure:	Fee structure (“nuisance fee”) Fees actually waived for most ISVs	Free of charge for any member of IBM PartnerWorld®

Program benefits

The program provides the following benefits:

- **Reduced Developer and Integrator costs**, by providing high-function hardware access without the associated costs of on-site physical servers — floor space, power, cooling, network, system administration headcount and so on
- **Access to a broad range of hardware systems**, including larger and better-configured systems than most developer and integrators have available on-site
- **Flexibility to work with multiple system configurations**, operating systems (OSes), and OS levels, without requiring multiple physical servers
- **Cost-free access to IBM middleware**, available through the IBM Software Access Catalog for VLP users on AIX or Linux
- **Data security** through the use of current technologies such as VPN and Advanced Encryption Standard (AES)

Architecture overview

The design and implementation of VLP make use of proven designs and existing or mature technologies as much as possible. To minimize costs and increase speed to deployment, VLP has been focused on

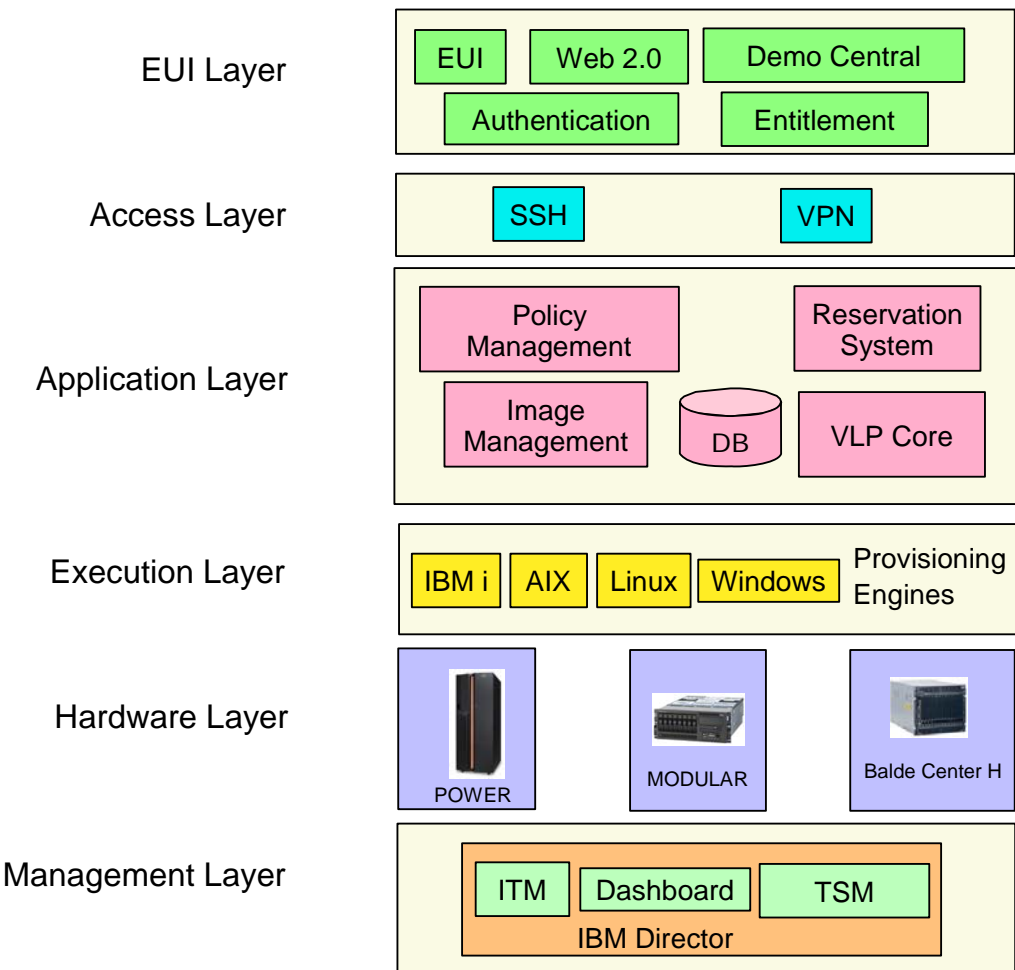
using technologies and products that have already been tested and are operational in production environments.

For the user's front end access, VLP relies on a graphical user interface (GUI), which is IBM Global Web Architecture compliant, running on top of IBM WebSphere® Application Server. For the *business services*, VLP relies on the PartnerWorld infrastructure for the authentication and on a policy manager to segregate the access to the backend infrastructure. The VLP Core component is the main engine federating the other components.

The provisioning services are provided by two efficient and reliable components:

1. MOAB (Workload Manager from Cluster Resources Inc) for the advanced reservation system and workload management
2. Dedicated provisioning engines (for AIX, Linux and IBM i) that have been optimized to provide the best efficiency on each of the IBM hardware platforms

For other functions, VLP concentrates on products that provide easy and flexible access to the functionality required or expected by the ISVs. See the following figure for a view of the components and layers.



Note that many of the concepts and components used here are not new, and in fact many have been implemented in isolation by various IBM organizations that provide services to their ISV communities.



However, what is unique about VLP is the intent to provide these services as an end-to-end solution, available to ISVs on demand, requiring significantly less manual system administrator intervention and scheduling.

Details of the current Virtual Loaner Program

VLP offers the following features and characteristics:

- **Duration:** Currently VLP offers the PartnerWorld member (to be referred to as *user*) no-charge access to logical partitions (LPARs) for up to 14 days. However, using the Save and Restore function, on dedicated partitions, this can be virtually extended indefinitely through multiple sequential reservations.
- **Partition types:** The root access (dedicated) environment allows the VLP user exclusive use of the resources with full root access (QSECOFR on IBM i) privileges. The VLP user can create accounts on the system, install middleware and perform all functions of a root access user.
- **Partition characteristics:** A dedicated VLP LPAR can be configured with either one CPU and 2GB of memory or two CPUs and 4 GB of memory. With full root-mode (QSECOFR on IBM i) access, the user is free to modify the operating system configuration, install fixes, updates and additional software. The user can also choose to save system images (as many images per user up to a total of 20 GB of storage) during the reservation period. User-customized saved system images can then be reloaded in subsequent reservations allowing the user long-term use via multiple sequential reservations. In addition, each VLP user has access to 10 GB of file storage in an NFS-mounted /home directory, which is available on all reserved LPARs and is also persistent from one reservation to another.
- **Reservation groups:** Resources can be reserved and used as a reservation group, so that multicomponent, multitier solutions can be developed and tested using multiple VLP partitions.
- **Secure remote network access methods:** Users can access the VLP machines through either the VPN concentrator and associated VPN client software provided, or through the SSH Gateway (using the PuTTY client, OpenSSH, or similar client program obtained by the user). The SSH Gateway enables connectivity to users who cannot use the Cisco VPN Client SW that is provided due to a user's internal network incompatibility.
- **Technical support:** VLP provides technical support through e-mail and a frequently asked questions (FAQs) section to the PartnerWorld member during their reservation period. For additional technical enablement support VLP users are connected to the IBM Virtual Innovation Center (see ibm.com/partnerworld/vic).

Appropriate uses for VLP

VLP is intended to meet many, but not all, of the typical developer and integrator's requirements for access to IBM systems and middleware. Some examples of the kinds of tasks that are appropriate for VLP systems today include:

- Basic application porting or debugging (for example, from another platform to POWER AIX systems), using command-line compilers, debuggers and build tools
- Application porting and testing on IBM hardware-software platform (for example, AIX plus IBM middleware such as WebSphere, DB2 and so on)
- Quality assurance testing (regression test) and certification of a current developer and integrator application on a new release of AIX or middleware (for example, going from AIX 5.3 to AIX V6.1)
- Quality assurance testing and certification of new version of developer and integrator application on current release of AIX and middleware



- Dynamic LPAR testing — test applications to ensure they are correctly DLPAR-aware or DLPAR-safe on AIX 5.3 or AIX 6.1
- Live Partition Mobility (LPM) on POWER6 systems
- Application performance tuning
- Application testing on early (pre-general announcement) IBM hardware, operating systems, and middleware (requires a separate Agreement for Exchange of Confidential Information)
- Limited application performance testing (“sniff test” benchmarks, not publishable benchmarks)
- Scalability testing of application with increasing number of CPUs and increasing amount of memory
- Multitier application testing using two or more LPARs simultaneously (for example, developer and integrator application plus WebSphere on one LPAR, DB2 on another)
- Replication of a customer problem with a particular software and hardware configuration

Examples of additional tasks a developer and integrator can accomplish with planned future enhancements to VLP include:

- Live Application Mobility (LAM) on POWER5 and POWER6 systems running AIX 6.1
- Middleware and kernel extension development, porting and testing

Examples of tasks that are unsuited to VLP include:

- Performance benchmarking requiring complete control of the environment under test
- IBM High Availability Cluster Multi-Processing (IBM HACMP™) configuration testing
- Marketing and sales demonstrations
- Production use

Conclusion

VLP is a rich, flexible and highly secure on-demand remote-access service for use by ISVs as an alternative to and adjunct to the use of traditional on-site loaner machines. Rather than shipping one or more loaner systems to each ISV, ISVs are given highly secure access (through a VPN or SSH and Web portal) to a pool of POWER and System x and BladeCenter systems, hosted by IBM and centrally managed as a “cloud.” A reservation system matches the ISV’s requirements to available or configurable systems or LPARs, then automatically provisions a system or LPAR with the required operating system and software stack, makes it available with a new VPN connection, and hands root-access control of the system or partition to the ISV.

ISVs then have full secure root-level access to the remote system for the duration of the reservation period to port, tune, test and maintain their software. ISVs can access their source code and test data in their normal build environment by SSH-tunneling over the VPN to their own file system or repository, or by copying a snapshot of the build tree to a secure global file system within the VLP environment.

ISVs can use the target system as-is, or further customize the system's software stack using their own software or installable images and middleware available on a Network Install Manager (NIM) server or the IBM Software Access Catalog. The customized system configuration can then be saved on a backend storage system, and restored in future sessions. At the end of the session, the remote system is scrubbed of any ISV data files and configuration changes, and returned to the idle pool to be reprovisioned (with clean OS image and software stack) and reused. Because the system environment, including the operating system and installed system software as well as user files, can be saved and quickly restored from one login session to another, VLP allows the ISVs to log in multiple times, on an as-needed basis, to accomplish their enablement tasks. This allows the ISVs to work in a natural, ad-hoc manner, rather than forcing them to do all necessary work within a fixed limited amount of time as with traditional loaner programs.



VLP makes available a brand new realm of possibility for IBM and ISVs by providing remote access to IBM hardware, operating systems, and middleware on demand — near instant access from any location and at any time. As a result, VLP helps reduce the cost of development for ISVs and speeds time to market for solutions on IBM platforms. VLP additionally reduces the cost of solutions enablement for IBM, expanding IBM's ability to provide IBM hardware to more and more SMB ISVs that were previously out of reach. Ultimately, VLP enables IBM to provide more solutions to its clients faster.



About the authors

Franck Barillaud joined IBM in 1989 in La Gaude (France) where he worked on different telecommunication projects as designer and architect. After the Tivoli acquisition by IBM in 1997, he moved to Austin, TX as international assignee to start joint development projects between the two sites. He has also been involved in the development of some of the Tivoli products. In 2001, he joined the System Group where he provides technical support for the ISVs. Franck is now the architect for the Virtual Loaner Program. Franck owns 17 IBM patents in the telecommunication and artificial intelligence area and a couple of recognition awards including the IBM France President's prize and the Technical Vitality prize. Franck graduated in Mathematics and Physics from the University of Rouen (France).

Phillip Puckett is the program manager for the Virtual Loaner Program. Phillip joined IBM in 1999 in Austin, TX working for the IBM ISV support team processing hardware and software configurations for ISV loans. He later went on to perform software development, building and designing tools and business processes in support of the Systems and Technology Group Business Partner mission. Phillip has 10 years of experience supporting the IBM Business Partner community. Phillip has an educational background in Computer Information Systems and a master's degree in business administration.

Resources

These Web sites provide useful references to supplement the information contained in this document:

- Virtual Loaner Program
ibm.com/systems/vlp
- IBM Systems on PartnerWorld
ibm.com/partnerworld/systems
- IBM System i and i5/OS Information Center
<http://publib.boulder.ibm.com/series/>
- IBM System p and AIX Information Center
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