Operating System Choices for Conditional Access Systems

Irdeto Access

1 Introduction

Irdeto Access has extensive experience and expertise in a variety of computing platforms for Conditional Access systems. An important aspect of such a platform is the choice of a suitable Operating System. Unix based platforms have been servicing the needs of Irdeto since the 80's and today Irdeto's leading IP Conditional Access solutions continue to support several Unix platforms, including Linux. The first generation of Irdeto's Conditional Access systems also were based on a Unix computing platform. Even though the Unix Operating System has performed well for Irdeto over the years, Irdeto's customers have highlighted some broader issues concerning the Unix Operating System that have been addressed in the latest generation of the Irdeto CA System technology.

Customers have expressed the requirement that the platform for the Conditional Access system not only should be reliable, it must also be easy to use and easy to maintain in order to minimize operator induced errors. Customers also stated that Unix operators, programmers and engineers are often more expensive and harder to find than recruiting staff that is familiar with the Windows environment. Clearly, all this should be achieved without compromising performance and security.

2 Operating System

There are a large number of Operating Systems for server class computers. In this document the focus is on the main Unix variant Linux and on Windows 2000, the main contender in this application area from Microsoft.

2.1 Operational Aspects

A key concern from most CA System operators is the degree to which the computing platform can be managed. This depends significantly upon the ability to Reduced operational and system complexity is an important means to achieve better response to anomalous system behaviour. Unix platforms have traditionally relied on text-based commands instead of graphical user interface. Only recently, attempts have been made to introduce graphical user interfaces for system management functions in some Linux distributions. As this is a relatively recent development, these are still not as mature and well known in comparison with the Windows 2000 Operating System, where most common basic system management and configuration tasks are very simple. The support of almost all PC component suppliers for the Windows 2000 platform, make it a very easy platform from an operational perspective. The main attraction of Linux is that one can modify its source code to suit particular applications' needs. Unfortunately, this further strengthens the need for experienced staff, as maintenance of such an adapted Linux system can be complex. In practice this means the difference between a Linux guru who charges twice as much as an MCSE professional. Installing upgrades on a Linux system requires more skills than is required for overseeing an update to Windows 2000.

2.2 Performance

The performance of Linux has always been at Unix levels. With the release of Windows 2000, Microsoft has come to at least an equal footing. On all performance metrics (networking performance, web server performance, file server performance, application server performance), Windows 2000 ranks in the top range together with some high end Unix Operating Systems. This is further withnessed by a number of transaction processing records that have been reported by Window 2000 platforms.

2.3 Availability

The degree of high availability that an operator may seek, is directly linked to the level of investment that the organisation is prepared to make in hardware, software, people and operations discipline. Almost all serious Operating Systems can be operated in a high availability mode. Clearly, this requires the correct design of all software components (applications, tools, utilities and drivers), a solid systems management toolset and the use of sound operation management practices. With Linux this can be accomplished as demonstrated by its use in many webservers. Microsoft designed Windows 2000 to achieve high availability. Top OEM suppliers offer a four nines (99.99%) uptime guarantee with approved configurations of Windows 2000 Datacentre Server. Uptimes as high as 5 nines (99.999%) can also be achieved by deploying failover clusters or by implementing higher availability Windows solutions.

For such high availability computing environments, Irdeto has designed its' CA System products to include support for fault tolerance. The Irdeto Access CA system products can recover from critical failures in our own software, but also from critical failures in the Operating System or in the database server applications. Without such attention to fault tolerance and fast recovery mechanisms, the CA System operator would have to assume fault free CA System software that would run on a fault free Operating System.

2.4 Interoperability

The large majority of the Conditional Access system Operators has accepted a mixed vendor scenario as no single vendor has a complete offering accross all product segments. In such an environment it is necessary to have a mechanism for sharing services and data accross disparate computing platforms. Windows 2000 obviously features strong interoperability with other Microsoft platforms, but also has improved on non-Microsoft interoperability and on adopting industry standards (like Java). Linux features a strong support for industry standards and despite an anti Microsoft attitude of most of its developers still features a reasonable interoperability with Microsoft platforms. In environments where strong interoperability accross various platforms is required, independent software vendors have developed a collection of enabling technologies that span a wide range of computing services found on disparate computing platforms.

2.5 Security

Security is an important aspect of an computing platform, as it is responsible for protecting valuable Operator assets and resources. Both Linux and Windows 2000 feature an extensive security toolset. The Linux security is usually fairly complicated to set-up, but requires less effort once installed, which may in large part be explained by the larger installed base of Windows 2000 servers, that form a more interesting target. As hackers and virus writers will turn to Linux as one of their next target, Linux will soon loose that advantage. The lack of an easy security update mechanism may then turn against the Linux security ratings. Microsoft, on the other hand, has concentrated on little else for the last year and holds a strong advantage in the automation of security administration and overall diagnostics and troubleshooting.

According to a recent report from the Aberdeen Group, open-source solution Linux has surpassed Windows as the most vulnerable OS as more than 50 percent of all security advisories that CERT issued in the first 10 months of 2002 were for Linux and other open-source software solutions. In the same period, Microsoft products accounted for a modest 25 percent of all CERT security advisories. Although some caution is required in interpreting these numbers as they cover a relatively short period of time, it still is a clear signal that Linux administrators need to stay alert.

In order to boost resistance against unauthorised access, Irdeto recommends that Conditional Access system Operators isolate the LAN in the Digital TV broadcast head-end from corporate LAN and/or WAN access either physically or logically by means of a Firewall. This measure augments the security measures of the Operating System and the operational systems management practices.

3 Conclusion

The religious debate about which Operating System is the best, may finally reach a conclusion as all candidates are converging on features and capabilities. Irdeto Access has expertise with a wide range of Unix and Windows Operating Systems. Based on client feedback, Irdeto has based its' latest Conditional Access products on Windows 2000, as this allows customers easier maintenance and operation without any penalties in performance, security, availability and interoperability. The move to a Windows 2000 platform also allows Irdeto clients to employ less costly engineering staff to efficiently operate and manage the systems. Similar benefits apply to the software engineering environment, which bring improvements to the application development and testing. The benefits of the transition from Unix to Windows 2000 again is another credit to the capability of Irdeto Access to adopt the best technologies for its clients.