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Lock&Tracksm Technical Overview (for IT/IS)

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Table of Contents

Overview of product organization	2
Client Side Overview	2
PC Workstations	2
User Interfaces	3
Network Components.....	3
End-User and Ad hoc Reporting.....	3
Server Side Overview	3
The Server : HP Integrity Servers with OpenVMS	3
Relational Database: Oracle/Rdb	4
Tools for Database Administration	4
Database Integrity Tools	4
System Security	5
System Management and Operations	5
Integration with Other Systems	6
Compliance with Common Technical Requirements	6
Support for Support Staff.....	7

Overview of product organization

LockWorks products are designed as client-server applications, with the client available in GUI or keyboard-only options. The server component is hosted on HP Integrity computers running OpenVMS with an Oracle/Rdb relational database. Two forms of installation are available: in-house and hosted service. The hosted service has very low maintenance requirements: support for existing computers, troubleshooting of internet connections, and account-support. In-house installations require support for the server system as negotiated between the customer and LockWorks. LockWorks has trained many IT professionals in product maintenance, provides support-tools, and also offers extensive support contract options. Full 24-365 support is available in both cases, and we guarantee every call to LockWorks support will be answered by qualified and trained LockWorks staff within 30 minutes.

Client Side Overview

PC Workstations

A **Lock&Track Production Client** is supported on Windows XP or newer, including Vista. (There are clients who continue to successfully run on older systems.) Since the **Lock&Track** Client application (GUI) is based on “thin-client” technology, the installation and in-use demands placed on a PC by this application component are very modest:

- 1Ghz Celeron-M
- 512 Mb RAM
- 20 Mb empty disk space
- network interface card and IP address

No special configuration is required, other than network capability, to get LockWorks GUI client products up and running on existing compatible PCs. Text-only (TUI) operation is possible from either PCs or *nix clients.

User Interfaces

As most IT personnel know, software users generally fall into two categories: occasional users, and expert users. The latter may prefer keyboard-only capability, while the former are assisted by tips, help menus, and contextual cues provided by graphics.

LockWorks has solved this conflict by providing two integrated interfaces, produced from one set of code. For most users, there is a modern windows-compliant GUI (graphical user interface) complete with help, tips, validation, and prompts. For expert-users, most modules¹ are provided in a text-only interface that is proven to increase data-entry speed significantly. An exception is made for inherently graphical modules like the photo line-up. We've even provided the same keyboard shortcuts “behind the scenes” in the GUI for the times a power-user finds themselves at a GUI-based workstation.

To facilitate user independence, interfaces components are consistent across modules and the expert-user interface can be disabled on a case by case basis. For expert users, most keyboard commands remain available in the GUI environment.

¹ LockWorks products are organized into coordinated applications that access the same data but focus on particular areas of functionality. These 'modules' can be turned on or off for groups of users, simplifying training and maintenance.

Network Components

All **Lock&Track** installations are designed for full compatibility with common off-the-shelf network components (hubs, bridges, routers, *etc.*). **Lock&Track** is intended to blend in and fit well with the customer's existing network infrastructure.

For **Lock&Track Online** customers, the network can be as simple as dial-up internet connectivity for PC workstations. (Where integration with cameras and fingerprint machines is desired, additional internal networking can be configured on installation.)

End-User and Ad hoc Reporting

Generating reports is the most important task any data-management product has, presuming secure and valid data maintenance as a basic expectation. LockWorks products are designed to support report-generation with the tools you or your users are already comfortable with, as well as providing sophisticated integrated tools. Hundreds of existing reports support most standard reporting, and there is flexible support for new report generation. Some of the currently supported tools include:

- Microsoft's Office Suite, including **Excel**, **Access** and **Word**, for many reporting, data extraction and analysis tasks. By extension, any of the other competing office productivity products which are ODBC compliant and capable, will work just as well.
- **Discoverer**, from Oracle Corp., for point-and-click reporting, data mining and "whatif" analysis.
- **Crystal Reports** for point and click report generation, especially where presentation-quality is important.
- **RAPT**, where desired. (Experienced technical staff can generally be trained in 1-2 days with LockWorks staff remaining available for query support.)

Ad hoc reports can be developed by IS staff, proficient users, or LockWorks personnel using any of these tools, or any other SQL-compatible tool.

Server Side Overview

The Server : HP Integrity Servers with OpenVMS

All LockWorks products are hosted on HP Integrity servers running OpenVMS. This is a combination whose lineage has a rock-solid track record spanning more than two decades. It offers excellent performance and value with scalability. Designed for mission-critical systems, HP's family of servers is designed for graceful management of disk-failure and seamless expansion.²

The OpenVMS operating system provides multi-user support, performance and the most advanced user-access control system available. Reliability is unmatched, and patches, required upgrades, and security concerns are less prevalent than with some popular operating systems. OpenVMS is an Open Systems compliant operating system with XPG3/XPG4 certification by national and international standards organizations. VMS systems have also received acclaim for being unusually secure at hacking competitions such as DefCon.³

Relational Database: Oracle/Rdb

Oracle/Rdb provides the data-management needs for all LockWorks products, leveraging the advanced security

² For more information, see HP's web site, or the server pages linked from <http://www.locktrack.com/technology.html>

³ For example, <http://www.pointsecure.com/pdf/Defconwhite.pdf>

of OpenVMS natively⁴. Rdb provides a database environment which supports high reliability, data integrity, open systems accessibility, optimal throughput and high performance. Features such as afterimage and recovery-unit journaling, together with the ability to perform on-line database verifications and backups, work together to guarantee data reliability. Internal features such as primary/foreign keys and relational constraints support data integrity.

Open systems access is provided by network features, cross-platform integration products and reliance on industry-standard SQL for query and update access. Multi-area and multi-file physical organization, hashed and sorted data indexes, data compression, physical and logical data placement controls all support highly optimized performance and throughput.

In compliance with industry-standard client-server application architectural principles, all **Lock&Track** and **Lock&Force** business rules are coded in *stored-SQL modules* in the Offender Database or via callbacks. This means the business logic resides on the server. This design enhances LockWork's product's modularity, making it straightforward and manageable to make deployment-specific customizations and enhancements to the product. *Changes in business logic or database requirements do not require updates to client-side software.*

Tools for Database Administration

Many of the tools provided are part of the foundation relational database software; others are extensions of those tools provided by LockWorks as part of **Lock&Track** itself. Among these tools and utilities are:

- **RMU (Relational Management Utility)**, which provides all required database administrative, control, monitoring, backup, recovery and restoration facilities.
- **SQL (Structured Query Language)**, which provides the industry-standard data manipulation and query language to support all database schema maintenance operations.
- **DBM (Database Manager's Utility)**, a menu-oriented, script-based tool which provides the means to do routine daily database verifications and backups, index rebuilds, data security adjustments, user access controls, and much more.

Database Integrity Tools

- **Test and verify** data recovery and restoration : typically, the total time to verify and backup an average-sized *Offender Database* is less than one-half hour⁵, making nightly full database backups feasible and recommended. After-image journaling makes recovery to last-committed transaction possible.
- **Full transactional protection** for the database, including automatic transaction journaling, run-unit journaling and auto-recovery, and numerous other database integrity features. Oracle/Rdb's after-image journaling, protects the database to the point of full recovery right up to the last-committed transaction prior to the failure.
- **Auto system restart and database recoveries** (recovery unit journaling) — the **Lock&Track Offender Database** is immediately available to the user community after a system reboot, without need for technical staff intervention. (Many installations run for years without reboots, and unplanned system reboots are extremely rare.)

System Security

*We take system security issues very seriously. Please refer to our white paper, “**Lock&Track Online AIRS:***

⁴ http://download.oracle.com/docs/html/A90407_01/ig_c2_appx.htm

⁵ Larger databases can, of course, take longer. This is for a typical installation.

Availability, Integrity, Reliability & Security — A Layered Approach,” for a detailed discussion of this critical topic.

Each user account has access that can be customized, providing for every interaction to be mediated, controlled and potentially reportable. All programs and data objects are protected by Access Control Lists (ACLs); this scheme complies with the C-2 computer systems security rating specified by the DoD “Orange Book.” *No elevated or special access permissions or privileges are required by any user for normal use of the system.* Password expirations and management policies can be specified and controlled by administrative staff according to the customer’s approved policies & procedures.

All security features are the result of “trusted kernel” implementation (again, as required by DoD standards), and are not “grafted on” by after-market or application software provisions. This insures robustness, reliability of the security technology and implementation, and gives the customer control and flexibility in implementing their existing policies or implementing new Federal or State requirements quickly.

Physical network security is compatible with current firewall technologies. LockWorks staff has extensive training and experience in firewall and protocol-oriented network security issues and technology and monitors new development regularly.

LockWorks has extensive expertise in the realm of computer systems security; we have conducted systems security trainings and seminars, and have provided computer security consulting services for the Oregon Department of Corrections, among others.

System Management and Operations

OpenVMS is a mature open systems OS with advanced management tools available. In addition, LockWorks has built tools for management tasks related to our products, including database, user-account, backup, and recovery tools. Among these tools and utilities are:

- **On-line backups and restoration** (full system, application and file-selective) are built into OpenVMS and limited only by physical backup-tape device data transfer and streaming times; they can, of course, be scheduled and logged, and they do not interrupt normal system activities.
- **Full and incremental recovery and restore** operations, for files, directories or entire disk volumes; high performance, high capacity tape drives.
- **User account management and control** including new-user authorization, password, username and access customization including rapid account-disabling; ability to *change* a username (*e.g.*, when a user gets married); control of account performance characteristics (resources); and user resource accounting are all supported with OS or LockWorks tools.
- **System security management and control**, including security policy and password management; system break-in detection; automatic break-in avoidance and alarms; complete system auditing, tunable at various levels; access controls (permissions) for all resources and objects.
- **Resource and performance monitoring**, including real-time displays of all system parameters and operating characteristics; performance logging; user and system process monitoring; process termination; error logging and analysis; crash-dump capturing and automatic analysis; automatic system tuning; automatic system recovery from a crash or power-fail event; automatic system and application software upgrade procedures; software product licensing utility; disk mounting and dismounting; plus network management and control utilities.
- **Print and batch queue management**, including the ability to define and control any printer or batch execution queue; queued job control and management; and automatic re-queuing of selected jobs.

Integration with Other Systems

LockWorks products provide integration capability with other vendors. New integration can be evaluated on a case by case basis. LockWorks is committed to developing these capabilities for all of our customers and will often assume new projects for one client based on general interest.

FTP or email delivery of reports and automated online delivery of reports for public-access requirements are well established. Integration with Livescan, Commissary, inmate calling, victim notification, image capture, biometrics, and other vendor systems is established, included and supported.

Compliance with Common Technical Requirements

LockWorks products are maintained in compliance with numerous industry standards for maximum compatibility with existing and emerging customer IS environments. In particular, **Lock&Track** is fully compatible with the following areas which are often identified as requirements:

- **Oracle database:** The **Lock&Track Offender Database** is an Oracle/Rdb relational database. As such, it is completely manageable by the customer's staff using existing Oracle tools and experience.
- **Windows Desktop Client:** The **LTClient** is a native 32-bit thin-client application. The GUI interface is 100% Windows-compliant with standardized interfaces across desktops.
- **Client-server architecture:** **Lock&Track** has been designed *from the beginning* according to client-server architectural principles, and we are readily and actively extending that architecture to encompass web-based deployments as well.
- **Intranet ready:** LockWorks products are ready for intranet or internet report presentation, making compliance with information availability easy.
- **Ad hoc reports & queries:** **Lock&Track** is fully compatible with any off-the-shelf report, query or data extraction tool which uses the ODBC protocol for database connectivity.
- **Network:** **Lock&Track** is fully compatible with contemporary LAN and WAN network technologies, using TCP/IP protocols. LockWorks has expertise designing and installing secured internet connectivity.
- **System security:** LockWorks products exceed State and Federal requirements for security. Changes in reporting and security requirements are fast-tracked in development to guarantee continued compliance.

Support for Support Staff

Hosted customers have integrated 24-365 support as part of the lease option. This means customers and support staff can call at any time for assistance with everything from crisis management to routine account questions. Regular user-group meetings provide the opportunity to discuss general use issues and allow for face to face time with staff, and in-house visits can be arranged as needed.

In-house installations get integrated initial configuration and orientation, several months minimum unlimited phone and in-house support, and the option of extended support. During covered support periods, experienced LockWorks staff are available at all times for individualized phone support, and on-site visits are scheduled for integration and available as needed after initial adoption.

In short, LockWorks places a premium on supporting our clients, and focuses on empowering IT and IS staff with transparent technical backing. You'll never get dedicated "support personnel" with us. You talk to someone who helped build and install your system and is personally invested in your satisfaction.