helpsystems

WHITE PAPER

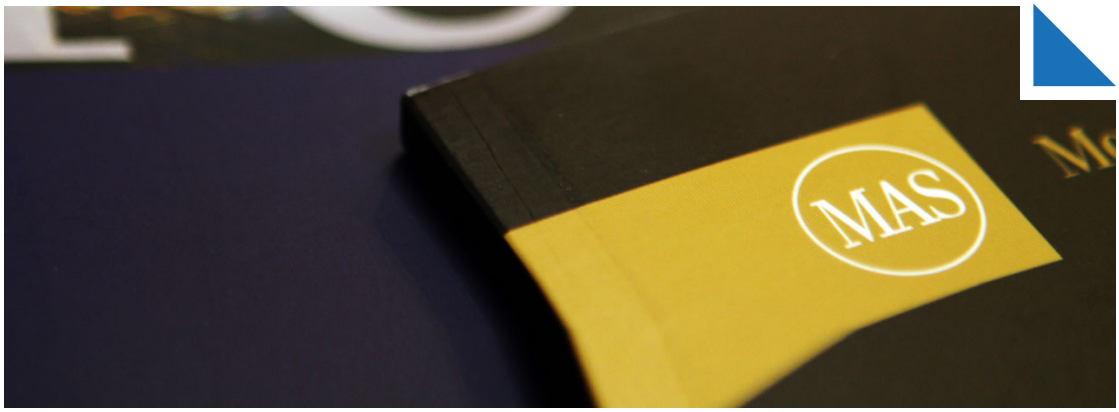
How HelpSystems Supports MAS TRM Notice and Guidelines

The Technology Risk Management (TRM) Guidelines provide comprehensive guidance to financial institutions (FIs) operating under license in Singapore. They establish principles and best practices around technology risk management and information security to address current and future technology risks. They also place responsibility on the board and senior management for ensuring that **effective internal controls and risk management practices are implemented to achieve security, reliability, resiliency, and recoverability.**

The TRM Notice consists of 12 separate notices, each covering a different type of financial institution in Singapore (e.g., commercial banks, merchant banks, insurance companies). These notices are effective from 1 July 2014 and each notice defines a set of legal requirements relating to technology risk management. These include requirements for a high level of reliability, availability, and recoverability of critical IT systems and for implementation of IT security controls to protect customer information from unauthorised access or disclosure. Failure to comply with the Notice can result in financial penalties and a revocation of licenses to operate in Singapore.

Because the IBM i is a unique platform, many of the technology products you would expect to ensure TRM compliance will either not work or perform inadequately on the platform.

You can't take any privileged access management solution and expect to fully govern privileged access on the IBM i. Many solutions only control access to shared accounts. Although this is a generally accepted practice, the guidelines specifically prohibit the sharing of privileged accounts. This means individual accounts must be created on each server and partition. One benefit of this is that all privileged activity including the users details, is fully captured in the audit logs, and this step meets another requirement in the guidelines.



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The IBM i presents a challenge to organisations looking to comply with the TRM guidelines. Just as most privileged access management solutions aren't good enough for compliance, the same is true of system management and disaster recovery solutions.

HelpSystems

HelpSystems is a global provider of systems and network management, security and compliance, and business intelligence solutions. Our software helps reduce data centre costs by improving operational control and delivery of IT services, which allows organisations to meet many aspects of the TRM guidelines.

To meet systems management requirements within the TRM guidelines, there is the Robot solution for the IBM i platform. It offers the world's most advanced, fully-integrated software for IBM i backup and recovery, system performance monitoring, production control, and message management.

PowerTech enables organisations using the IBM i platform to meet many of the security requirements within the TRM guidelines. It allows organisations to centrally create and manage user profiles across multiple systems, to limit and report on the activity of privileged user accounts, to audit and control access through all common network services, and to report real-time security events to SIEM solutions.

How HelpSystems helps you meet TRM Guidelines

The core of the TRM guidelines is a group of principles and accompanying requirements. Differing vendor products may be needed for each of those principles. In certain cases, multiple products may be needed to meet the accompanying requirements.

With products built specifically for IBM i, only HelpSystems can ensure that your platform complies with TRM requirements. Other solutions are forced to compromise platform-specific security and system management best practices in order to support multiple platforms. Helpsystems can provide the compliance solutions you need without compromise and without dealing with multiple vendors.

HelpSystems and Security TRM Guidelines

The following table shows exactly how HelpSystems security products from PowerTech can help organisations meet TRM guidelines for the IBM i platform.

6.2 Security Requirements and Testing	
6.2.1 The FI should clearly specify security requirements relating to system access control, authentication, transaction authorisation, data integrity, system activity logging, audit trail, security event tracking, and exception handling in the early phase of system development or acquisition. The FI should also perform a compliance check on the FI's security standards against the relevant statutory requirements.	PowerTech provides software solutions that allow the FI to enforce its security requirements on IBM i for access control, authentication, data integrity, event tracking, activity logging, and audit trail. The software enables the FI to perform automated compliance checks on its IBM i security standards against the relevant statutory requirements. Non-compliance can easily be identified from the reports. *Relevant Products:* Network Security, Compliance Monitor, Interact, PowerAdmin, DataThread
9.3 Networks and Security Configuration Management	
9.3.3 The FI should deploy anti-virus software to servers, if applicable, and workstations. The FI should regularly update anti-virus definition files and schedule automatic anti-virus scanning on servers and workstations on a regular basis.	PowerTech's anti-virus solution is the only product available that is able to deploy as native anti-virus software on IBM i. It will also work on AIX and Linux. *Relevant Products:* StandGuard Anti-Virus
9.6 Security Monitoring	
9.6.1 Security monitoring is an important function within the IT environment to detect malicious attacks on IT systems. To facilitate prompt detection of unauthorised or malicious activities by internal and external parties, the FI should establish appropriate security monitoring systems and processes.	PowerTech provides the greatest level of security monitoring on IBM i. It can record privileged sessions and monitor all activities, including command and SQL tool usage. Security events can be fed into SIEM solutions. *Relevant Products:* Network Security, Interact, Authority Broker, Compliance Monitor

9.6 Security Monitoring (continued)	
9.6.2 The FI should implement network surveillance and security monitoring procedures with the use of network security devices, such as intrusion detection and prevention systems, to protect the FI against network intrusion attacks as well as provide alerts when an intrusion occurs.	PowerTech monitors 30 exit points for IBM i and provides real time event monitoring in Security Information and Event Management (SIEM) and Intrusion Detection (IDS). *Relevant Products:* Network Security, Interact
9.6.3 The FI should implement security monitoring tools which enable the detection of changes to critical IT resources such as databases, system or data files and programs, to facilitate the identification of unauthorised changes.	PowerTech can detect, monitor, and report system, database, and file changes to IBM i. In addition, it controls what changes can be made and by whom. The software can also provide access control around sensitive command interfaces. *Relevant Products:* Authority Broker, Command Security, DataThread, Interact
9.6.4 The FI should perform real-time monitoring of security events for critical systems and applications, to facilitate the prompt detection of malicious activities on these systems and applications.	PowerTech performs real-time monitoring of security events for IBM i. *Relevant Products:* Interact
9.6.5 The FI should regularly review security logs of systems, applications and network devices for anomalies.	PowerTech allows organisations to review security logs for anomalies and allows these logs to be sent to SIEM solutions for review. *Relevant Products:* Compliance Monitor, Interact
9.6.6 The FI should adequately protect and retain system logs to facilitate any future investigation. When determining the log retention period, the FI should take into account statutory requirements for document retention and protection.	PowerTech captures security logs and allows them to be saved and stored for future use. Security log information can be transferred via SEIM in real time. *Relevant Products:* Compliance Monitor, Interact

11.0 Access Control	
c. Access control principle – The FI should only grant access rights and system privileges based on job responsibility and the necessity to have them to fulfil one's duties. The FI should check that no person by virtue of rank or position should have any intrinsic right to access confidential data, applications, system resources or facilities. The FI should only allow staff with proper authorisation to access confidential information and use system resources solely for legitimate purposes.	PowerTech governs privileged access and determines what activities individual privileged users can do, irrespective of rank or position. *Relevant Products:* Network Security, Authority Broker, DataThread, PowerAdmin, Command Security
11.1 User Access Management	
11.1.1 The FI should only grant user access to IT systems and networks on a need-to-use basis and within the period when the access is required. The FI should ensure that the resource owner duly authorises and approves all requests to access IT resources.	PowerTech can provide time-based access control and privileged escalation. *Relevant Products:* Network Security, PowerAdmin, Authority Broker
11.1.2 Employees of vendors or service providers, who are given authorised access to the FI's critical systems and other computer resources, pose similar risks as the FI's internal staff. The FI should subject these external employees to close supervision, monitoring and access restrictions similar to those expected of its own staff.	PowerTech can control access to IBM i by third parties. It governs what they can do and when they can do it, while providing granular monitoring and reporting of their activities. *Relevant Products:* Network Security, Compliance Monitor, Authority Broker, Command Security
11.1.3 For accountability and identification of unauthorised access, the FI should ensure that records of user access are uniquely identified and logged for audit and review purposes.	PowerTech gives the FI individual records of each and every IBM i user. *Relevant Products:* Network Security, Compliance Monitor, Authority Broker

11.1 User Access Management (continued)	
11.1.4 The FI should perform regular reviews of user access privileges to verify that privileges are granted appropriately and according to the 'least privilege' principle. The process may facilitate the identification of dormant and redundant accounts as well as detection of wrongly provisioned access.	PowerTech ensures that the FI can enforce a 'least privilege' policy. Dormant accounts can easily be identified, closely monitored, and disabled before being removed. *Relevant Products:* Compliance Monitor, Authority Broker
11.1.5 Passwords represent the first line of defence, and if not implemented appropriately, they can be the weakest link in the organisation. Thus, the FI should enforce strong password controls over users' access to applications and systems. Password controls should include a change of password upon first logon, minimum password length and history, password complexity as well as maximum validity period.	While the IBM OS enforces the password controls, PowerTech can report on the current state and compare it to a desirable baseline policy. It also reports whether default passwords are present. *Relevant Products:* PowerTech Compliance Monitor, Agent for SecureID
11.1.6 The FI should ensure that no one has concurrent access to both production systems and backup systems, particularly data files and computer facilities. The FI should also ensure that any person who needs to access back-up files or system recovery resources is duly authorised for a specific reason and a specified time only. The FI should only grant access for a specific purpose and for a defined period.	PowerTech allows users to swap profiles and assume elevated authority for defined periods, subject to approvals for specific purposes. *Relevant Products:* PowerTech Compliance Monitor, Authority Broker

11.2 Privileged Access Management	
11.2.3 The FI should closely supervise staff with elevated system access entitlements and have all their systems activities logged and reviewed as they have the knowledge and resources to circumvent systems controls and security procedures. The FI should adopt the following controls and security practices:	
b. Institute strong controls over remote access by privileged users;	PowerTech provides a wide range of access controls to govern privileged user remote access into IBM i. *Relevant Products:* Network Security, Authority Broker
c. Restrict the number of privileged users;	PowerTech can restrict, monitor, and report on the total number of privileged users accessing IBM i. *Relevant Products:* Network Security, Compliance Monitor, Authority Broker
d. Grant privileged access on a "need-to-have" basis;	PowerTech allows FIs to grant privileged access to IBM i on a need-to-have basis. It can govern access based on a range of criteria, including time and role. *Relevant Products:* Network Security, Authority Broker
e. Maintain audit logging of system activities performed by privileged users;	PowerTech maintains logs of all privileged access and activities on IBM i. It can record screen images of the actual changes made by privileged access. *Relevant Products:* Network Security, Compliance Monitor, Authority Broker
f. Disallow privileged users from accessing systems logs in which their activities are being captured;	PowerTech governs privileged account access and ensures that privileged users managing IBM i can't access and tamper with system logs. *Relevant Products:* Authority Broker
g. Review privileged users' activities on a timely basis;	PowerTech creates activity reports according to a schedule. *Relevant Products:* Compliance Monitor, Authority Broker

11.2 Privileged Access Management (continued)	
h. Prohibit sharing of privileged accounts;	PowerTech ensures that privileged accounts are not shared. Access can be tied to specific IP addresses for privileged users and two-factor authentication tokens used. *Relevant Products:* Network Security, Authority Broker, Agent for SecureID
i. Disallow vendors and contractors from gaining privileged access to systems without close supervision and monitoring;	PowerTech ensures third party privileged account access is closely controlled and monitored. *Relevant Products:* Network Security, Authority Broker, Command Security
j. Protect backup data from unauthorised access.	PowerTech ensures only authorised privileged users can gain access to backup data. Reports can be generated to show who has SAVSYS rights on the system. Robot/SAVE can provide tracking of backup/recovery events. *Relevant Products:* Network Security, Authority Broker, Command Security, Robot/SAVE

PowerTech Security Modules

PowerTech Compliance Monitor: Define policy and report against IBM i system value, user profile, object, and audit journal data. Run regular audit reports showing exceptions to policy.

PowerTech Authority Broker: Limit and report on the activity of privileged user accounts like QSECOFR. Enforce separation of duties and monitor powerful users.

PowerTech Network Security: Audit and control access through all common network services (exit points), including FTP and ODBC. Control and audit user access from personal computers.

PowerTech Interact: Send IBM i security events in real time to Security Information and Event Management (SIEM) and Intrusion Detection (IDS). Real-time integration with SIM and IDS consoles.

PowerTech DataThread: Database monitoring solution that lets you automate, streamline, and centralize your IBM i database monitoring process. Real-time IBM i database monitoring and notification.

PowerTech Command Security: Monitor selected commands and define customized actions to control unauthorized use. Control the unrestricted use of commands.

PowerTech PowerAdmin: Create and manage user profiles across multiple systems from a central management system. Simplify user profile management across systems.

PowerTech StandGuard Anti-Virus: Native protection for IBM i, AIX, Linux, and Domino servers, powered by McAfee. Guard against viruses, worms, and malware threats.

PowerTech Agent for Secure-ID: SecurID Agent brings the full functionality of the market-leading RSA SecurID two-factor authentication solution to IBM i users.

HelpSystems and System Management TRM Guidelines

The following table shows exactly how the HelpSystems system management solution, Robot, can help organisations meet TRM guidelines for the IBM i platform.

7.0 IT Service Management	
7.1.6 Change Management To minimise risk associated with changes, FI's should perform backups of affected systems or applications prior to the change. The FI should establish a rollback plan to revert to a former version of the system or application if a problem is encountered during or after the deployment. The FI should establish alternative recovery options to address situations where a change does not allow the FI to revert to a prior status.	Robot automates saving and restoring IBM i data to tape or disk prior to any change and also provides media management. For any recovery or rollback, the system automatically creates step-by-step instructions and provides controlled yet rapid and easy access when required. Robot also enables archiving of data and reports to tape or disk. *Relevant Products:* Robot/SAVE, Robot/REPORTS
7.3 Incident Management An IT incident occurs when there is an unexpected disruption to the standard delivery of IT services. The FI should appropriately manage such incidents to avoid a situation of mishandling that result in a prolonged disruption of IT services or further aggravation.	Because Robot manages incoming messages and monitors resources and system logs, it can identify potential problems and incidents when they occur on IBM i. Robot sends email, text, and SNMP messages in reaction to events on the system. It can provide automatic notification when IBM i needs assistance. Robot also provides centralized control of all Robot software running on partitions. *Relevant Products:* Robot/CONSOLE, Robot/ALERT, Robot/SCHEDULE, Robot/SPACE, Robot/NETWORK
7.4.1 Problem Management While the objective of incident management is to restore the IT service as soon as possible, the aim of problem management is to determine and eliminate the root cause to prevent the occurrence of repeated problems.	Robot contains several functions that work proactively to eliminate the root cause of common incidents, thus preventing them from happening in the first place. *Relevant Products:* Robot/CONSOLE, Robot/ALERT, Robot/SCHEDULE, Robot/SPACE, Robot/NETWORK

7.0 IT Service Management (continued)	
7.4.2 The FI should establish clear roles and responsibilities of staff involved in the problem management process. The FI should identify, classify, prioritise and address all problems in a timely manner.	Robot identifies, classifies, and prioritises problems with IBM i. It can look to resolve issues itself or to alert staff and provide them with information about the problems. Robot allows the FI to address problems in a timely manner, far quicker than if they were just reliant on staff or business service management solutions. *Relevant Products:* Robot/CONSOLE, Robot/ALERT, Robot/SCHEDULE, Robot/SPACE, Robot/NETWORK
7.4.3 To facilitate the classification process, the FI should clearly define criteria to categorise problems by severity level. To effectively monitor and escalate problems, the FI should establish target resolution time as well as appropriate escalation processes for each severity level.	Robot is able to identify and categorise problems by severity level. It can also automatically react and escalate issues accordingly, allowing the FI to set aggressive RTO times. *Relevant Products:* Robot/CONSOLE, Robot/ALERT, Robot/SCHEDULE, Robot/SPACE, Robot/NETWORK
7.4.4 A trend analysis of past incidents should be performed to facilitate the identification and prevention of similar problems.	Robot allows the FI to capture events and store that information for future analysis. Incident trends can also be viewed on dashboards. SEQUEL can query that data to identify trends. *Relevant Products:* Robot/CONSOLE, Robot/ALERT, Robot/NETWORK, SEQUEL Software
7.5 Capacity Management	
7.5.1 To ensure that IT systems and infrastructure are able to support business functions, the FI should ensure that indicators such as performance, capacity and utilisation are monitored and reviewed.	Robot captures key performance, capacity, and utilisation indicators, which can be reviewed and monitored in Robot or through the production of reports. *Relevant Products:* Robot/CONSOLE, Robot/NETWORK, Robot/SPACE, Robot/REPORTS
7.5.2 The FI should establish monitoring processes and implement appropriate thresholds to provide sufficient time for the FI to plan and determine additional resources to meet operational and business requirements effectively.	Robot allows the FI to set thresholds. The system can issue alerts and advisories when thresholds are reached and when they are broken. With this information, the FI has a complete picture, allowing it to allocate additional resources as required. All information can be stored in reports for future analysis. *Relevant Products:* Robot/CONSOLE, Robot/NETWORK, Robot/SPACE, Robot/ALERT, Robot/REPORTS

8.0 Systems Reliability, Availability and Recoverability	
8.1.1 Systems Availability Important factors associated with maintaining high system availability are adequate capacity, reliable performance, fast response time, scalability and swift recovery capability.	With Robot, the FI can monitor key performance and availability metrics in real-time. Alerts are issued based on thresholds, which help the FI take timely action to ensure that there is capacity and that systems are running optimally. Should a system fail, it can be recovered or a backup system brought online quickly. *Relevant Products:* Robot/CONSOLE, Robot/NETWORK, Robot/SCHEDULE, Robot/SAVE, Robot/SPACE, Robot/ALERT
8.1.2 An FI may employ a number of complex interdependent systems and network components for its IT processing. An entire system can become inoperable when a single critical hardware component or software module malfunctions or is damaged. The FI should develop built-in redundancies to reduce single points of failure which can bring down the entire network. The FI should maintain standby hardware, software and network components that are necessary for fast recovery.	With Robot, the FI can setup configurations that anticipate failure of certain components (e.g., node systems or jobs) without business impact. Robot products can also be installed in a fully mirrored high availability environment for additional resilience. *Relevant Products:* Robot/CONSOLE, Robot/NETWORK, Robot/SAVE, Robot/SCHEDULE, Robot/SPACE, Robot/ALERT
8.2 Disaster Recovery Plan	
8.2.1 In formulating and constructing a rapid recovery plan, the FI should include a scenario analysis to identify and address various types of contingency scenarios. The FI should consider scenarios such as major system outages which may be caused by system faults, hardware malfunction, operating errors or security incidents, as well as a total incapacitation of the primary DC.	Robot supports the implementation of a complete disaster recovery strategy, including the rotation of data and system saves, management of saved media across multiple data centres, encryption of data on media, and full or partial recovery. This strategy is suitable for recovery after system outage, system fault, hardware malfunction, operating error, security incidents, and total incapacitation of the primary DC. *Relevant Products:* Robot/SAVE, Robot/ALERT

8.2 Disaster Recovery Plan (continued)	
8.2.3 To strengthen recovery measures relating to large scale disruptions and to achieve risk diversification, the FI should implement rapid backup and recovery capabilities at the individual system or application cluster level. The FI should consider inter-dependencies between critical systems in drawing up its recovery plan and conducting contingency tests.	Robot automates saving and restoring IBM i data prior to any change and also provides media management. For any recovery or rollback, the system automatically creates step-by-step instructions and provides controlled yet rapid and easy access when required. *Relevant Products:* Robot/SAVE, Robot/AIERT, Robot/REPORTS
8.3 Disaster Recovery Testing	
8.3.1 During a system outage, the FI should refrain from adopting impromptu and untested recovery measures over pre-determined recovery actions that have been rehearsed and approved by management. Ad hoc recovery measures carry high operational risks as their effectiveness has not been verified through rigorous testing and validation.	Robot automates saving and restoring IBM i data prior to any change and also provides media management. For any recovery or rollback, the system automatically creates step-by-step instructions and provides controlled yet rapid and easy access when required. Robot's save and restore procedures have been rigorously tested and fully adhere to best practices defined by IBM. *Relevant Products:* Robot/SAVE, Robot/ALERT, Robot/REPORTS
8.3.2 The FI should test and validate at least annually the effectiveness of recovery requirements and the ability of staff to execute the necessary emergency and recovery procedures.	In both live or production/lab environments, Robot automates saving and restoring IBM i data and provides media management. For any recovery or rollback, the system automatically creates step-by-step instructions and provides controlled yet rapid and easy access when required. This allows the process to be tested and validated periodically. *Relevant Product:* Robot/SAVE

8.4 Data Backup Management	
8.4.1 The FI should develop a data backup strategy for the storage of critical information.	Robot helps the FI define a robust and complete data backup and recovery strategy. For any recovery or rollback, the system automatically creates step-by-step instructions that allow a reliable execution and maximise RTO (recovery time objectives). *Relevant Products:* Robot/SAVE, Robot/REPORTS
8.4.3 The FI should carry out periodic testing and validation of the recovery capability of backup media and assess if the backup media is adequate and sufficiently effective to support the FI's recovery process.	In both live or production/lab environments, Robot automates saving and restoring IBM i data and provides media management. For any recovery or rollback, the system automatically creates step-by-step instructions and provides controlled yet rapid and easy access when required. This allows the process to be tested and validated periodically. Robot tracks tape media usage to ensure all media is replaced regularly to avoid possibility of tape media errors. Robot also supports backup to disk. *Relevant Product:* Robot/SAVE
8.4.4 The FI should encrypt backup tapes and disks, including USB disks, containing sensitive or confidential information before they are transported offsite for storage.	Robot can encrypt IBM i backup data onto tapes or disks. *Relevant Product:* Robot/SAVE
9.0 Operational Infrastructure Security Management	
9.1.3 To achieve security of data at endpoints, the FI should implement appropriate measures to address risks of data theft, data loss and data leakage from endpoint devices, customer service locations and call centres. The FI should protect confidential information stored in all types of endpoint devices with strong encryption.	Robot can encrypt IBM i backup data onto end-point tapes or disks. *Relevant Product:* Robot/SAVE

9.0 Operational Infrastructure Security Management (continued)	
9.1.5 For the purpose of exchanging confidential information between the FI and its external parties, the FI should take utmost care to preserve the confidentiality of all confidential information. For this purpose, the FI should at all times take appropriate measures including sending information through encrypted channels (e.g. via encrypted mail protocol) or encrypting the email and the contents using strong encryption with adequate key length. The FI should send the encryption key via a separate transmission channel to the intended recipients. Alternatively, the FI may choose other secure means to exchange confidential information with its intended recipients.	Robot supports the selective saving of data for the purpose of information exchange with external parties. Robot allows the FI to use a secure encryption key to secure the data on tape media prior to transport. External parties receiving the tape media must be provided with the correct encryption key in order to decrypt the saved data. *Relevant Products:* Robot/SAVE

Robot System Management Modules

Robot/CONSOLE: Message management software monitors system console messages, resources, and system logs. It performs recovery procedures, notifies experts, and redirects or suppresses messages automatically.

Robot/NETWORK: IBM i network control software monitors your network (or partitions) for events that need corrective action. It distributes operating instructions for the Robot products to network systems (or partitions) automatically.

Robot/ALERT: Provides notification if IBM i needs assistance. Sends text, email, and SNMP messages in reaction to events on the system or from programs.

Robot/SPACE: Eliminates disk space crises. It collects disk usage statistics, predicts future disk usage, and performs over 20 disk clean-up duties.

Robot/SAVE: Backup and recovery software automates saving and restoring IBM i data and provides tape management. It can restore a single object or the entire system.

Robot/REPORTS: Report management software automates the operator duties of report bursting, distribution, bundling, and archiving. Secure, selective online report viewing.

Robot/SCHEDULE: Advanced batch job scheduler that monitors all jobs at a granular level, anticipating potential problems and proactively acting and alerting accordingly.

SEQUEL Data Access and Reporting

SEQUEL Software: From simple ad hoc queries to executive dashboards to providing information on the web, SEQUEL delivers IBM i data in the format that works best for the organisation and users.

Summary

No one solution will allow an organisation to meet MAS TRM guidelines in full. Each organisation will need to build a solution using technology that is already deployed, along with either purchasing new technology to fill gaps or developing compensating controls.

IBM i organisations attempting to use products that aren't specifically for the IBM i platform to meet the MAS TRM guidelines run significant operational risks. Because these products are not completely fit for purpose, the organisation could be opening up security or operational holes. This is further compounded by a false sense that simply using the products meets the requirements. As a result, attention is turned elsewhere and the products are only checked occasionally.

When it comes to the IBM i, HelpSystems has the most comprehensive product set available on the market and it's completely fit for purpose, as it has been developed to work only on the IBM i. HelpSystems is the only vendor whose products enable organisations to meet both the security and system management requirements of the MAS TRM guidelines.

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About HelpSystems

HelpSystems is a leading provider of systems & network management, business intelligence, and security & compliance software. We help businesses reduce data center costs by improving operational control and delivery of IT services.

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