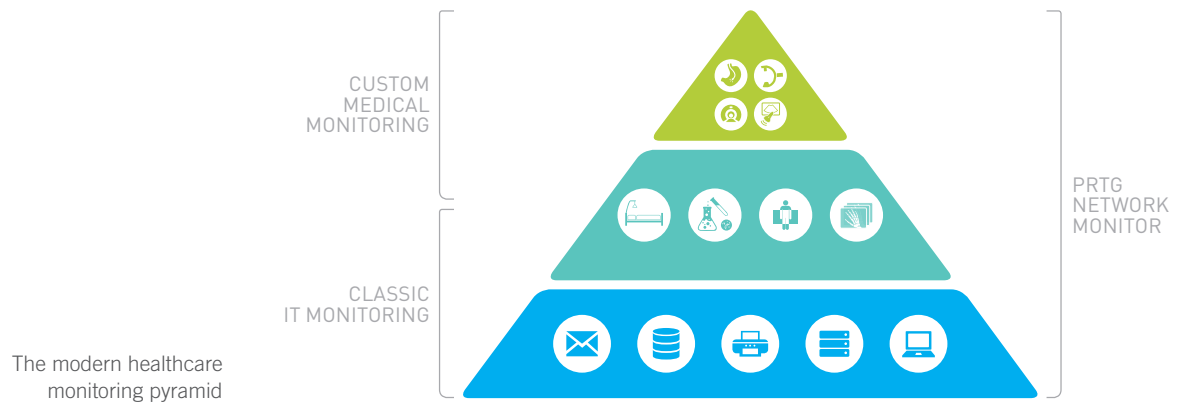




IT Monitoring in Hospitals

DICOM, HL7 and Integration engine

Modern hospitals are highly digitalized. Availability of patient data is at the core of this digitalization. It is essential that doctors have access to patient data when they need it, and that multiple IT systems work together to ensure this happens seamlessly. These systems include medical and imaging devices, imaging data, information systems and a central integration engine, as well as traditional IT infrastructure like switches, servers, databases and storage systems.



Digitalization and Centralization

Digital transformation started a few years ago in modern hospitals. This transformation is shifting responsibility of medical device infrastructure into the IT department. Why? Some of the reasons are already visible when we look at how doctors work today. Digital screens are replacing print-outs: 15 years ago, patients were shown a hardcopy of their X-Ray images, while today, images are sent directly to monitors on the wall, or to the physician's tablet. In most cases, doctors want fast access to patient data. This could be X-Ray, MRT or ultrasound images, laboratory or specialist results, the patient's history, or details of the patient's primary care physician. All this data is transported via the hospital's system infrastructure:

- **HIS** (Hospital Information System) – master data
- **LIMS** (Laboratory Information System) – laboratory data
- **RIS** (Radiology Information System) – radiology data

Images generated from devices like X-Ray, MRT, ultrasound or video endoscopies are stored on the PACS (Picture Archiving and Communication System).

Nowadays most hospitals have a central integration engine connecting these systems together, so the doctor has access to all relevant patient information at any time.

IT as the Foundation of all Communication

All medical devices require a classic IT infrastructure for communication. This infrastructure looks after the data transfer and provides the hardware for the system network. Cables, switches, servers and storage systems are required, as well as WIFI and its access points. Security also plays an important role. Hospital IT is no longer isolated; it is entwined with various institutions (insurance companies, doctors, building technology, administration, etc.), placing extremely high expectations on firewalls, virus scanners and intrusion detection systems.

Monitoring in the Hospital

Only when classic IT can guarantee performance and security does it fulfil its purpose. The foundation of these medical devices and systems requires comprehensive IT monitoring. Availability of devices, data transfer and application performance must be kept under continuous observation. IT monitoring, or network monitoring, is not new. There are numerous solutions available. However, many solutions do not have the possibility to integrate medical devices into the monitoring.

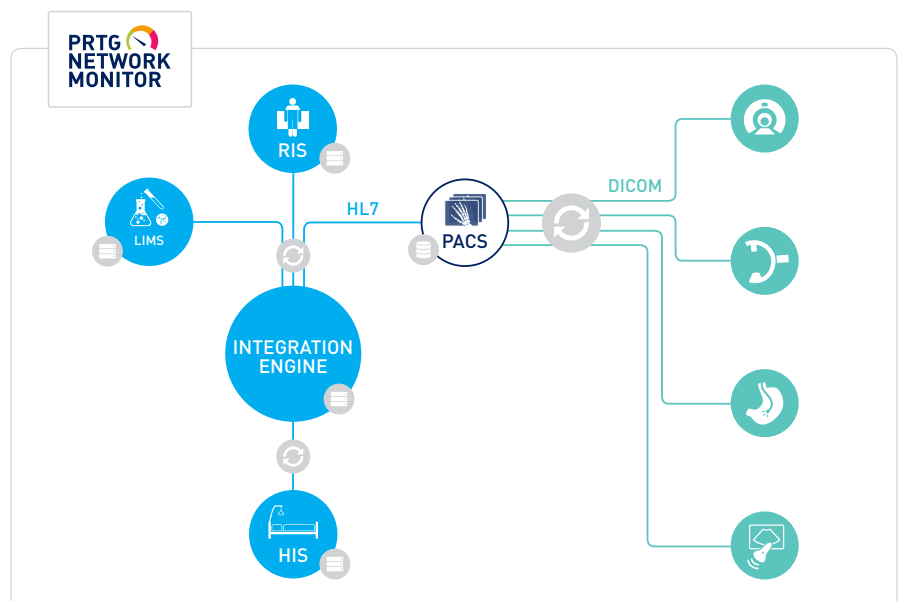
There are home-grown solutions out there, but they generally offer insufficient monitoring for a lot of effort. Professional monitoring systems have a range of features to collect, store, analyse and publish data, along with mechanisms to notify users of faults.

Building a home-grown monitoring solution goes beyond the capability of most hospital IT Teams, and ends up with compromised functionality. There's also the risk of creating two stand-alone systems, as responsibility for the different systems is split. This subsequently impedes overall visibility.

Let's go back to the X-Ray scenario. A doctor is at the patient's bed; What does he do if the X-Ray image does not come through to his tablet? He would probably ask the medical equipment department if the X-Ray machine is working. If it is running, the doctor might then check the PACS and RIS, followed by the integration engine. If everything on the medical side is working, the error is most likely on the classic IT side: Is a switch or firewall down, or is there problem with the data transfer? The more people and systems involved, the more laborious it is to find the fault. A central system that monitors both standard IT and the medical equipment has enormous benefits.

Medical Equipment and IT Together in PRTG

PRTG Network Monitor is made by Paessler. It has roots in classic IT, and, with over 200,000 users worldwide, sets the standard in network monitoring. Paessler extended the REST Custom Sensor and data protocols, DICOM and HL7, to make centralised monitoring for the health sector even easier.



PRTG integrates and monitors IT and healthcare infrastructure

ABOUT US

Paessler AG's award winning PRTG Network Monitor is a powerful, affordable and easy-to-use Unified Monitoring solution. It is a highly flexible and generic software for monitoring IT infrastructure, already in use at enterprises and organizations of all sizes and industries. 200,000 IT administrators in more than 170 countries rely on PRTG and gain peace of mind, confidence and convenience. Founded in 1997 and based in Nuremberg, Germany, Paessler AG remains a privately held company that is recognized as both a member of the Cisco Solution Partner Program and a VMware Technology Alliance Partner. Learn more about Paessler and PRTG at www.paessler.com.

With PRTG's REST Custom sensors, it is possible to connect to integration engines (like Orchestra made by Soffico) via RESTful API. Using DICOM, image data, X-Ray devices, MRTs, ultrasonic and video endoscopies can be pulled into the monitoring overview. HL7 is the most common protocol used to transfer patient data, and with PRTG's native HL7 feature, systems like HIS, RIS and LIMS can also be pulled into the central monitoring view.

The set-up and functionality of data transmission, storage, analysis, and publishing in medical technology is the same as the classic IT network. PRTG users can define thresholds to warn them before an outage occurs. They decide how to receive such alerts: Via email, SMS, push notification, or otherwise. The notification feature provides huge value for those on call – they will immediately see where the issue lies, and if the issue has been acknowledged by the responsible party.

PRTG brings two worlds together in one view: Classic IT and medical IT. Users can create customized dashboards with Drag & Drop to visualize all technology components in the hospital. The dashboard can be built to display malfunctions, interferences or outages as soon as they occur, and configured to inform, or alert, the responsible parties.

Many hospitals have different sites. Using the free PRTG remote probes feature is a lean and easy way to monitor multiple sites with one installation/license of PRTG. Another flexible feature in PRTG is the REST Custom Sensor. It enables the administrator to easily integrate all devices offering a REST API into PRTG. That could be refrigerators, sensors for monitoring temperature, air quality or humidity, as well as systems for premises security.

Overview

Here are some features that make PRTG the perfect hospital monitoring solution:

- PRTG monitors **DICOM** and **HL7** – out of the box
- **RIS, HIS, LIMS, PACS** and your complete hospital IT at a glance
- Integration of integration engines
- All-in-One Solution for Healthcare and IT
- Monitoring of multiple sites with one license
- **REST Custom Sensor** for integration of environmental monitoring other devices

Personal Data is not Accessed

Patient data is managed and transferred via HL7. PRTG uses HL7 to ensure data is transferred securely and to monitor the machines involved. PRTG has no access to personal data. Only data type, volume, pathway and device state are monitored.