Telecom Innovation In Mobile Health Units

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Disclosure
Leonardo Melo

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How we could transmit Big Data from remote or itirant Healthcare Unit ?

Some hospitals can produce more than 90 Gbytes per day!

How to transport big data using any kind of communication channel?

1. Regarding the DICOM data to be transmitted:

- Reception and delivery of DICOM original data, facilitating report, operation and manipulation;
- Analyze the data to be forwarded;
- Extreme data compression, lossless;
- In case of interruption, transmission of only the missing data.

2. Regarding the means of communication:

- Statistical analyzes of the available means of communication to calculate the optimal size of the blocks to divide the data;
- Opening of encrypted tunnels only as needed;

3. Regarding data management:

- Communication network management;
- On-line monitoring of the whole process, from end to end.

Patents, knowledge, laboratories, awards, oral presentations, writed technical books & articles, etc . . .

Communication equipments for mobile healthcare units . . .

Specialized system of transmitting medical images and other useful information.

From any kind, from any where….

Up to 8 comm media

DicomGateway for mobile units

Compact more than **93%**, lossless !

Our technology can be **11x** more fast using the modems of mobile phones!

. . . and itinerant or fixed healthcare units !
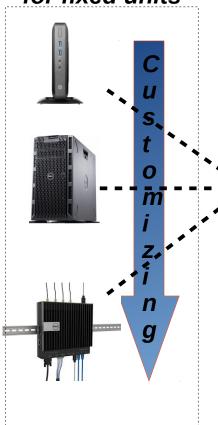
Mobile or Itinerant Healthcare Unit

DicomGateway for fixed units

Customizing

It can be more than **190x** more fast in hostile comm systems . . .

Up to 8 comm media

And it can be **90x** more fast with stable metropolitan networks!

Our Data Center

. . . *Process* . . .

1. Mobile or Itinerant Healthcare Unit

Communications

2. Our Data Center and Network Operational Center

3. Medical Doctors (by telemedicine, directly) or Hospitals

From Internet
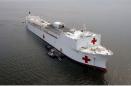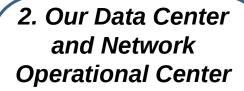
10x to 90x more fast

Up to 96% more efficient

hospital

. . . Network Operational Center . . .

Comm media

NOC

Medical Operation

Manage & Report

Environments

hospital

- Analyze and manage all connected equipments (modalities, computers, etc);
- Communication status;
- Report of the technical characteristics;
- Transmission volume reports: current, daily, bi-monthly;
- Various others reports and graphs.

. . . *Medical Operation* . . .

Medical Remote Access

Up to 8 comm media

Healthcare Units

Any kind of comm media!

Our Data Center

LAN

WAN

High Availability

Medical Report Center

And whats the reaaly result?

Tradicional: 300 Mbytes of any data transfer.

The system brings together multiple channels, making it a single multiplexed environment... virtually adds upload capacity!

Telecom Channel Example:
1 Mbps upload – 40 min of I/O

Diagnext.com:
1,000 Mbytes of any data transfer or 4,200 Mbytes DICOM.

Case studies

	Mobile Units from		Amazonas State Hospitals
	São Paulo State	**Bahia State**	
Healthcare Units	4 Mobile Units	3 Mobile Units	61 Hospitals
Radiologic Equipments	CRs (mammography)		CRs (mammography and X-Rays)
Communication method	*3 x chips of mobile phone (diferent operators)*	*1 -2 x chips of mobile phone (diferent operators), and local connection (unstable and with low speed).*	*1 satelite connection (128 – 256 kbps, unstable, Ku)*
Transmitions end	DICOM imagens insert in a PACS		
Results: Quantity / time	**50-60 exms/day**	**150-170 exms/day**	**100,000 exms/year** *(42,000 mammo, 58,000 x-rays)*
Results: Average transmission time	**5 to 10 minutes**	**All exams received at 21h**	**2 - 5 minutes; Maximum 10 minutes**
Final Conclusion	*The equipment finishes transmitting shortly, before the end of the next mammography exam.*	*The equipment transmitts all the exam before 18h to 21h.*	*The equipment terminates the transmission quickly, so that the patient does not return to his place of origin (indigenous tribes, riverside, etc.) without evaluation of the potential health risk.*

Conclusion

- The proposed communication system is able to efficiently manage, storage (more than 93%) and transmit a large volume of exams in the shortest possible time (96% more efficient);

- Our technology works with up to 8 diferent communication channels, can provide internet access and transmit DICOM images, together and simultaneously;

- Capable of storing a large volume of exams if there aren't currently communication channels capable or available to transmit all the data;

- All the solution can be customized following the necessity of healthcare unit and existed communication channels.

Any doubts?
Thank for your attention!

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