



# Stronger Than Firewalls: The Detroit Water Experience with Waterfall Security Solutions' Unidirectional Security Gateways

Biren Saparia  
Detroit Water and Sewerage Department

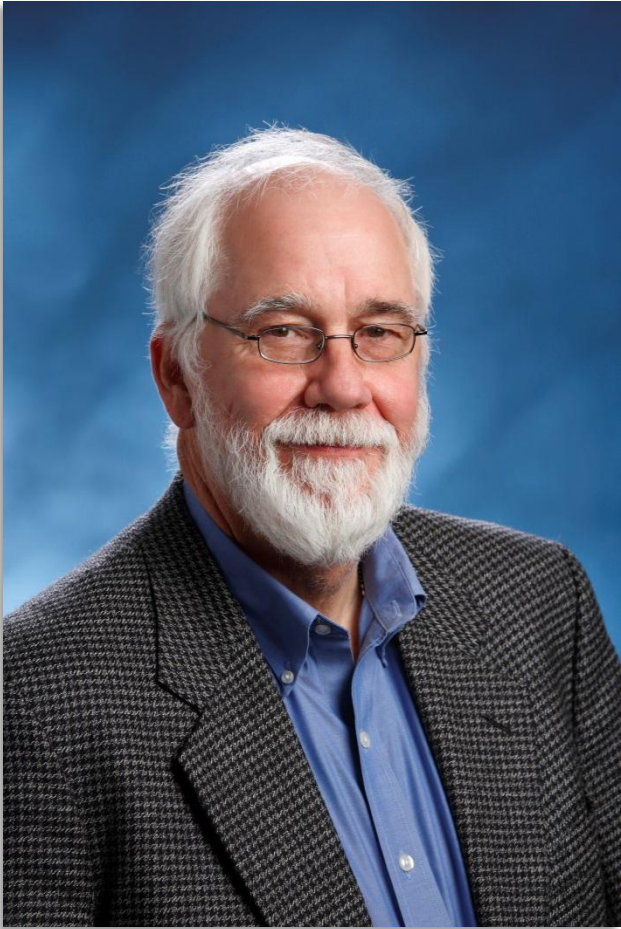
Presented by

Andrew Ginter  
Waterfall Security Solutions

# Agenda

- **Review of Agenda**
- **Webinar Series and Partner Solution Showcase**
- **Introduction**
- **Connectivity and Security Needs**
- **Waterfall for OSIssoft PI<sup>®</sup>**
- **Applications Enabled at DWSD**
- **Unidirectional Security Gateways**
- **Questions**
- **Conclusions and Thank You!**

# Mission



**“Our mission is to maximize the Value our customers get from our product and services”**



# OSIsoft® Partner Solution Showcase

- Find software solutions from OSIsoft partners with specific industry and domain expertise.
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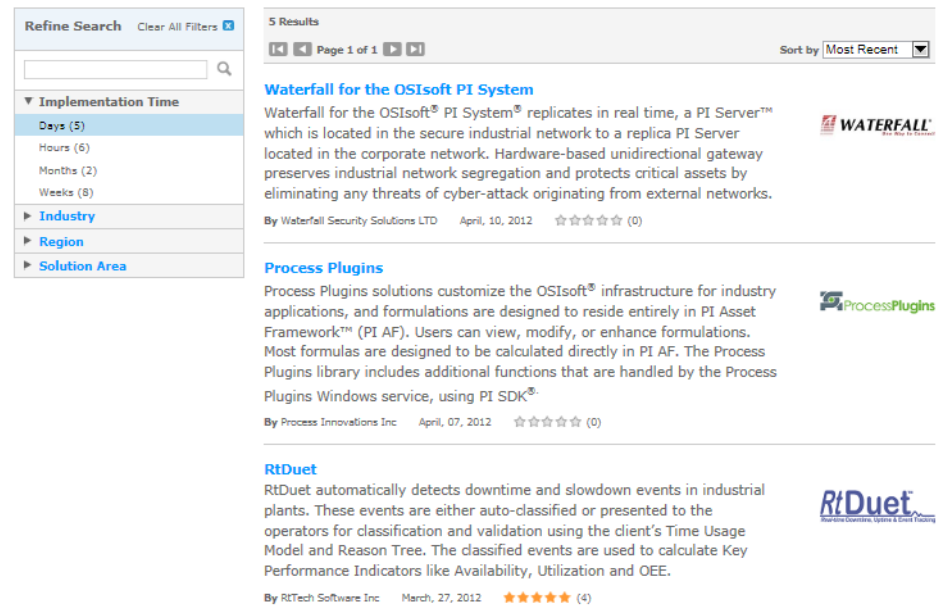


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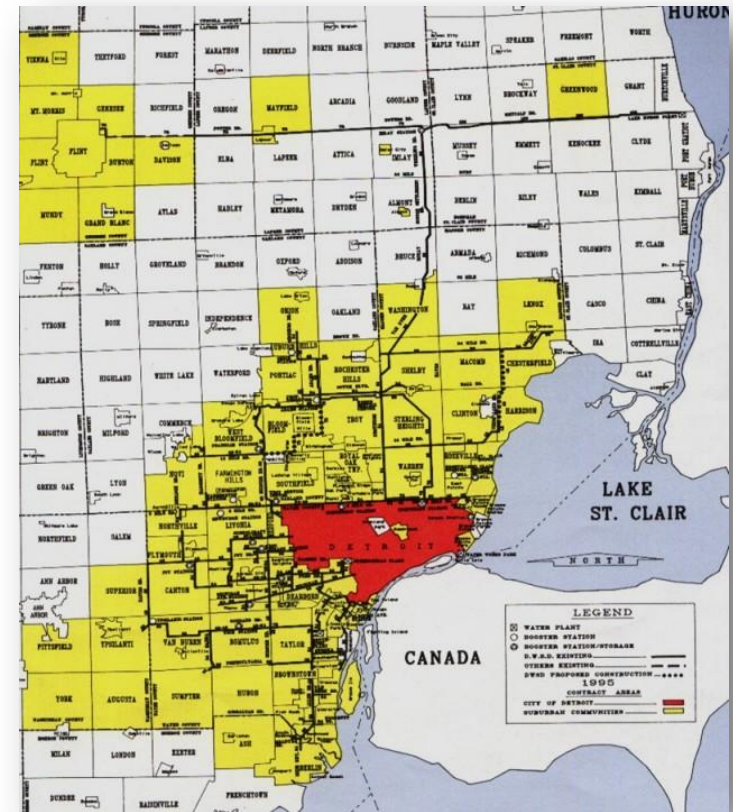
The screenshot displays the 'Refine Search' section on the left, with filters for 'Implementation Time' (Days (5), Hours (6), Months (2), Weeks (8)), 'Industry', 'Region', and 'Solution Area'. The main content area shows '5 Results' with a 'Sort by' dropdown set to 'Most Recent'. The first result is 'Waterfall for the OSIsoft PI System' by Waterfall Security Solutions LTD, dated April 10, 2012, with 0 ratings. The second result is 'Process Plugins' by Process Innovations Inc, dated April 07, 2012, with 0 ratings. The third result is 'RtDuet' by RTTech Software Inc, dated March 27, 2012, with 4 ratings. Each result includes a brief description of the solution.

# Presenters

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# Detroit Water and Sewerage Department

- 5 water treatment plants
- 20 water booster stations
- 10 wastewater collection stations
- 1 wastewater treatment plant
- 8 combined sewer overflow basins
- 13 in-system storage devices
- 200 remote monitoring/control sites:
  - Valve, pressure, sewer meter, precipitation gauge, CSO outfall, dam, level monitor





# Detroit Water and Sewerage Department



# Waterfall Security Solutions

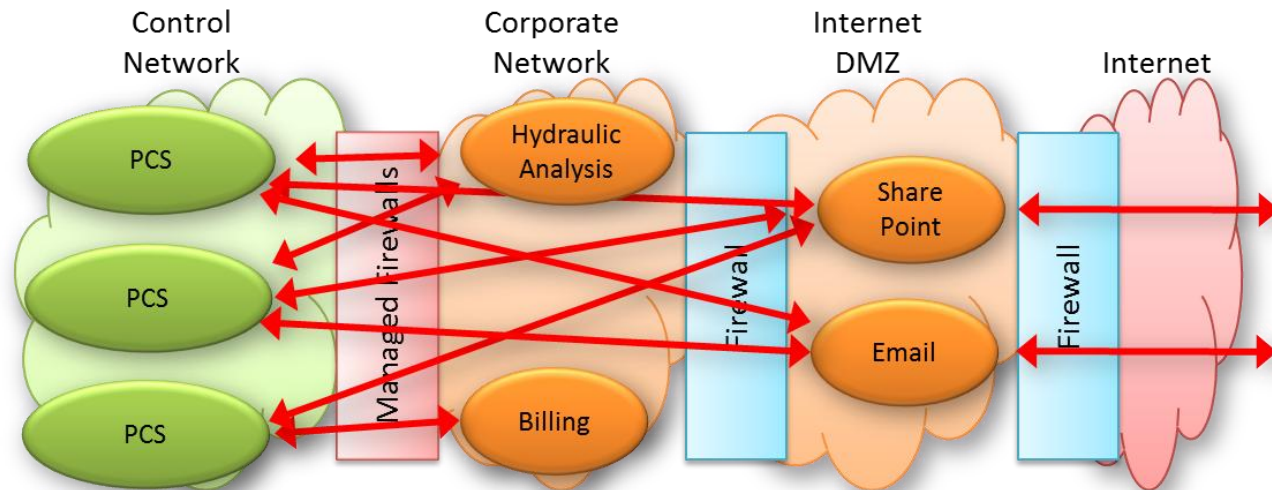
- Headquarters in Israel, operations office in the USA
- Market leader for Unidirectional Security Gateways for industrial sites
- Idaho National Labs: “physics” of system prevents online attacks
- Frost & Sullivan 2012 Award for Network Security for Industrial Control Systems
- Pike Research: Waterfall is key player in the cyber security market
- Common Criteria EAL 4+ certification
- Strategic partnership/cooperation with OSIssoft





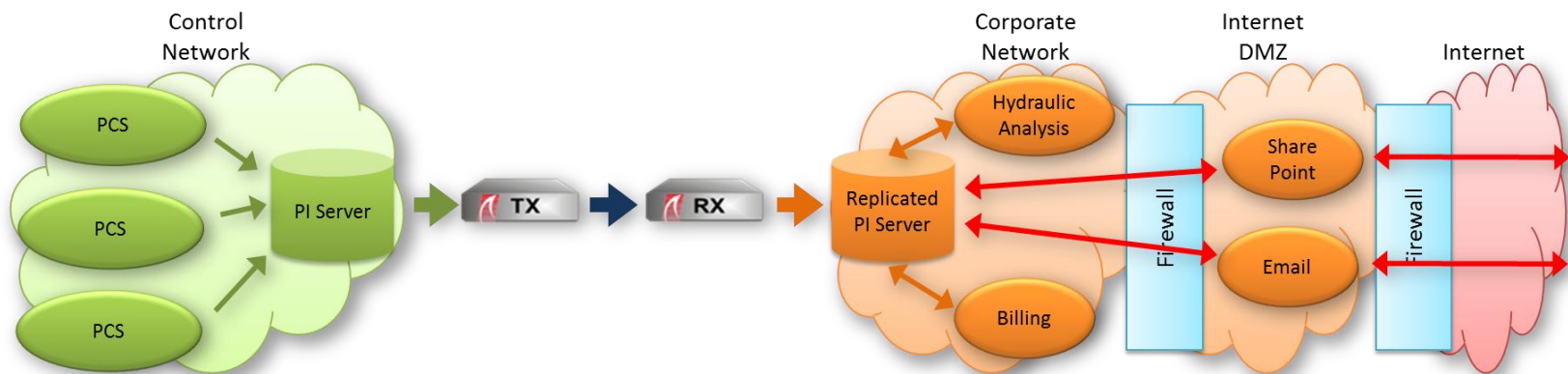
# Connectivity and Security Needs

- Third-party-managed HA firewall pair for control network
  - \$10,000/month cost
  - Control network originates connections, but traffic is bi-directional
- Many data sources/destinations – “spaghetti code” data flows
- Firewall configuration is opaque – no reviews, no alerts
- Internal audit flagged firewall security as unacceptable



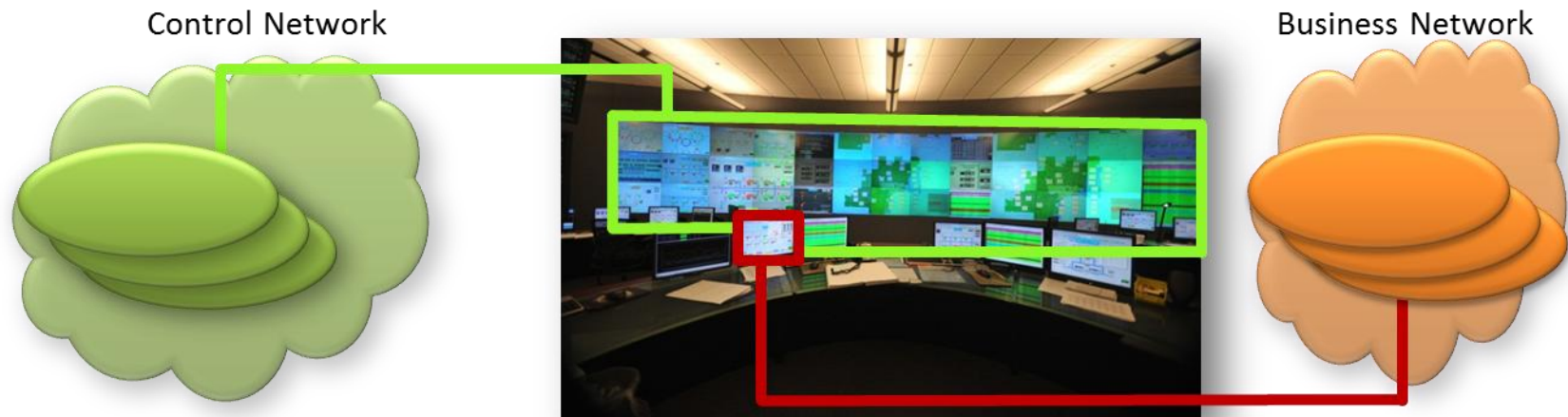
# Waterfall for OSIsoft PI®

- Deployed OSIsoft PI Server and replica: aggregate all information to be shared with business network
  - All data is available in standard format
  - Adding business applications or data visibility requirements is straightforward
- Unidirectional Gateway solution provides absolute protection from online attacks from external networks



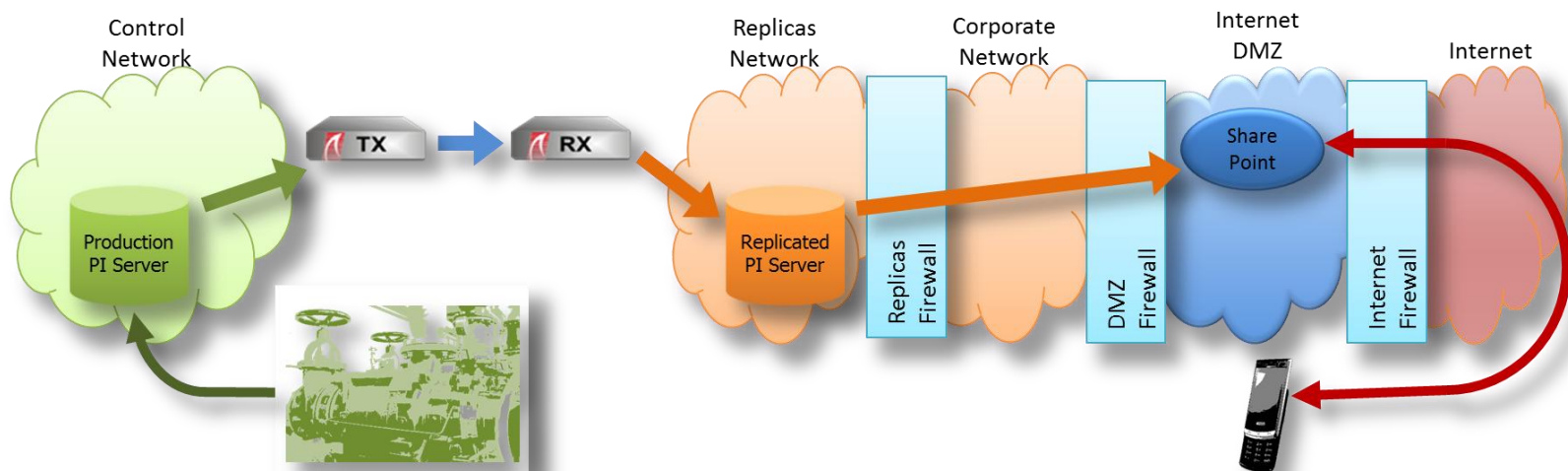
# Hydraulic Analysis & Optimization

- Detailed model of levels, flows and pumps – advises operators on pump selection to minimize power usage
- DWSD pays \$50M/year for power – savings are 5%-7%
- Must have access to (AMR) system and GIS system
- Operators see analysis & recommendations on workstation physically connected to business system



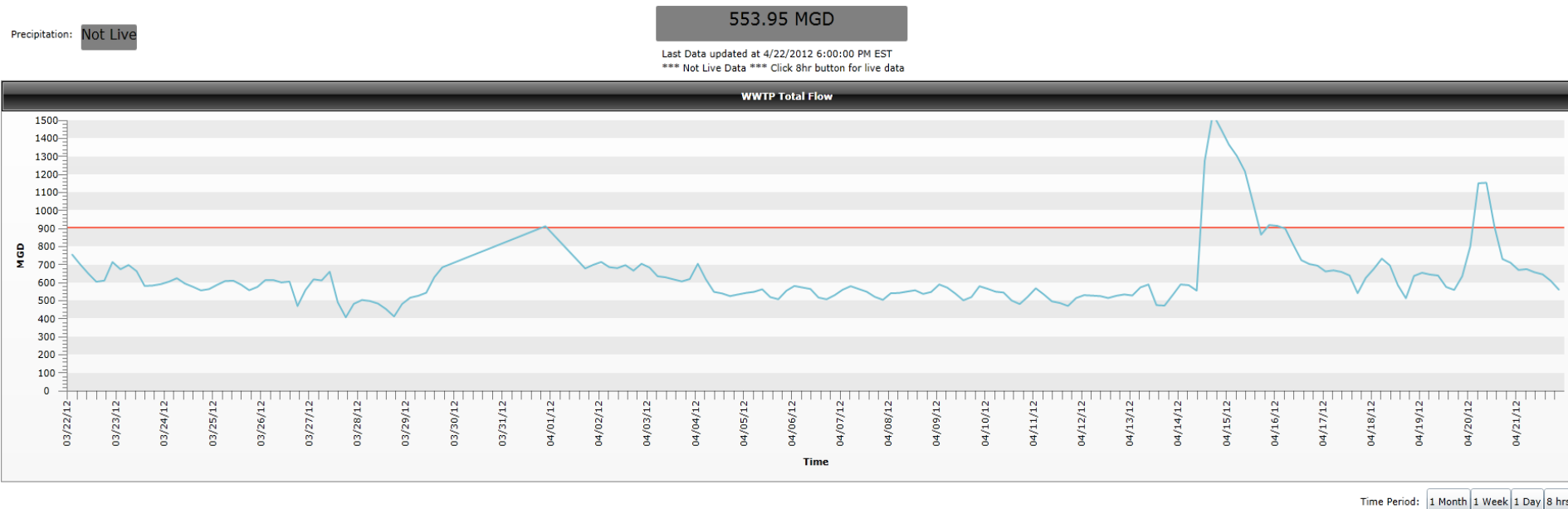
# Secure Loop Checks

- Compare field equipment readings with readings PI System -> SharePoint -> Internet -> cell phone
- On-site fault diagnosis, no waiting for over-loaded system operators
- No risk of Internet compromise affecting water system operations



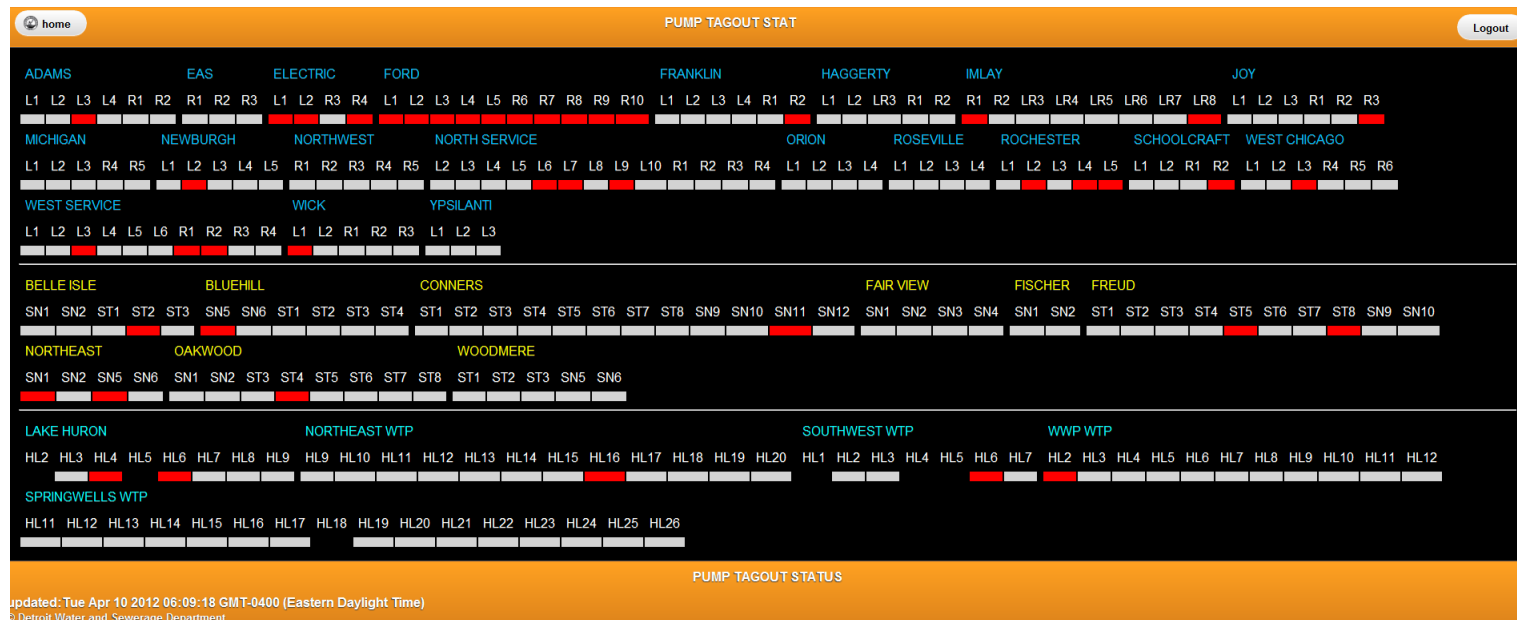
# Real-Time Billing Information

- DWSD serves 127 smaller sewage utilities
- 5-minute usage data replaces daily-usage report - allows utilities to compare DWSD consumption with own data
- Internet connectivity to replica no threat to PCS network



# Equipment Uptime

- DWSD objective: 95% equipment availability
- Replaces weekly equipment availability report
- Management can see progress and focus on problematic equipment





# Firewalls Are Not Enough

- Errors and omissions leave you open to attack
- Every allowed connection is vulnerable, even “one-way”
- Steal the password and you are in
- Attacks jump through VPNs – you trust the users, should you trust their computers

***Firewalls are software – they rely on process and people to keep them secure***



Photo: Red Tiger Security

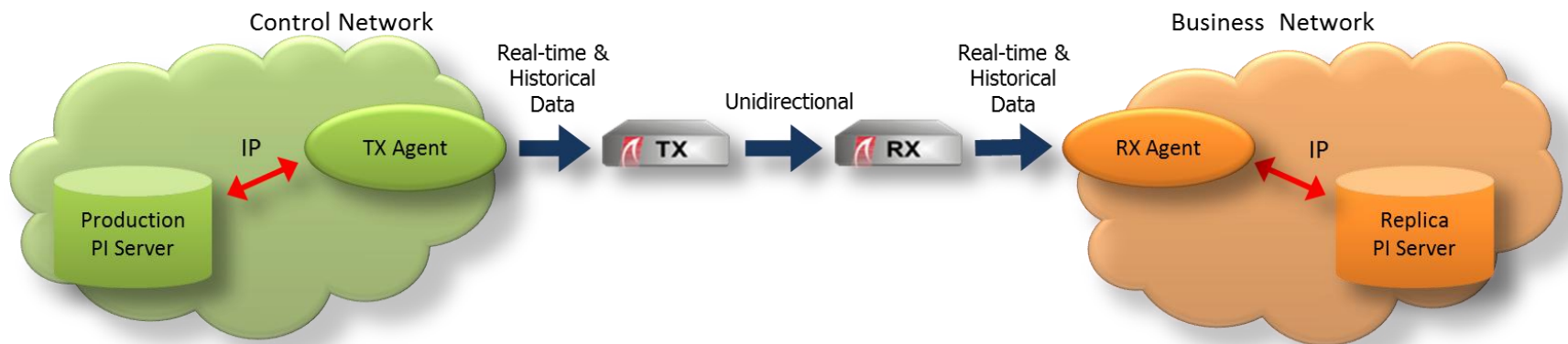
# Unidirectional Security Gateways

- Laser in TX, photocell in RX, fibre-optic cable – you can send data out, but nothing gets in to protected network
- TX uses 2-way protocols to gather data
- RX uses 2-way protocols to publish data
- Server replication, not protocol emulation



# Waterfall for OSIsoft PI®

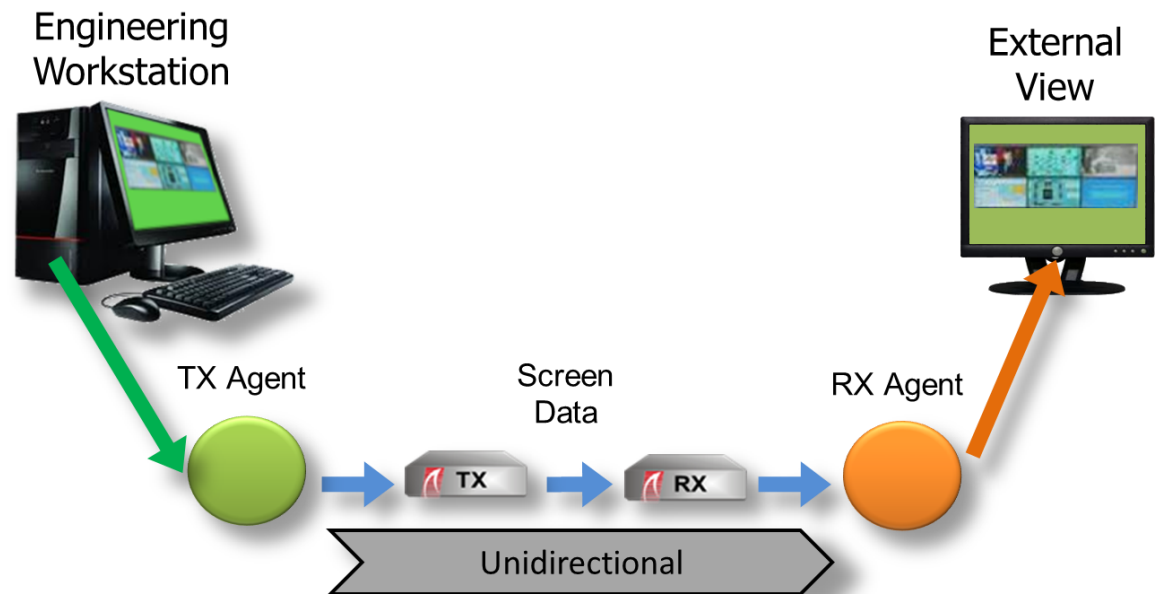
- TX agent is conventional PI Client – requests data
- RX agent is conventional PI Interface Node – records data
- TX agent sends data, not PI System protocol, over to RX
- Complete replica, tracks all changes, new tags, alerts in replica



# Waterfall Remote Screen View

- Vendors see control system screens in web browser
- Remote support under control of on-site personnel
- Vendors supervise site personnel
- Site personnel supervise the vendors

***Both sets of needs are met***



# Summary

# Stronger Than Firewalls

- Security: absolute protection of safety and reliability of control system assets, from network attacks originating on external networks
- Cost: reduces security operating costs – improves security and saves money in the long run
- Compliance: best-practice guidance, standards and regulations are evolving to recognize strong security

## *Questions?*





# Contacts – Follow up

**What would your systems look like after a conversion by Waterfall Security Solutions?**

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# Upcoming Webinars

**October 17** - Overall Equipment Effectiveness in the PI System Ecosystem

**November 7** - Process Calculations and Characterization embedded in PI Asset Framework

**December 5** - KPIs, Data and Events On Any Mobile Device

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# Thank you

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