



# SpireCapture™ DATA CENTER PLATFORM

**Complete utility management at your finger tips.**



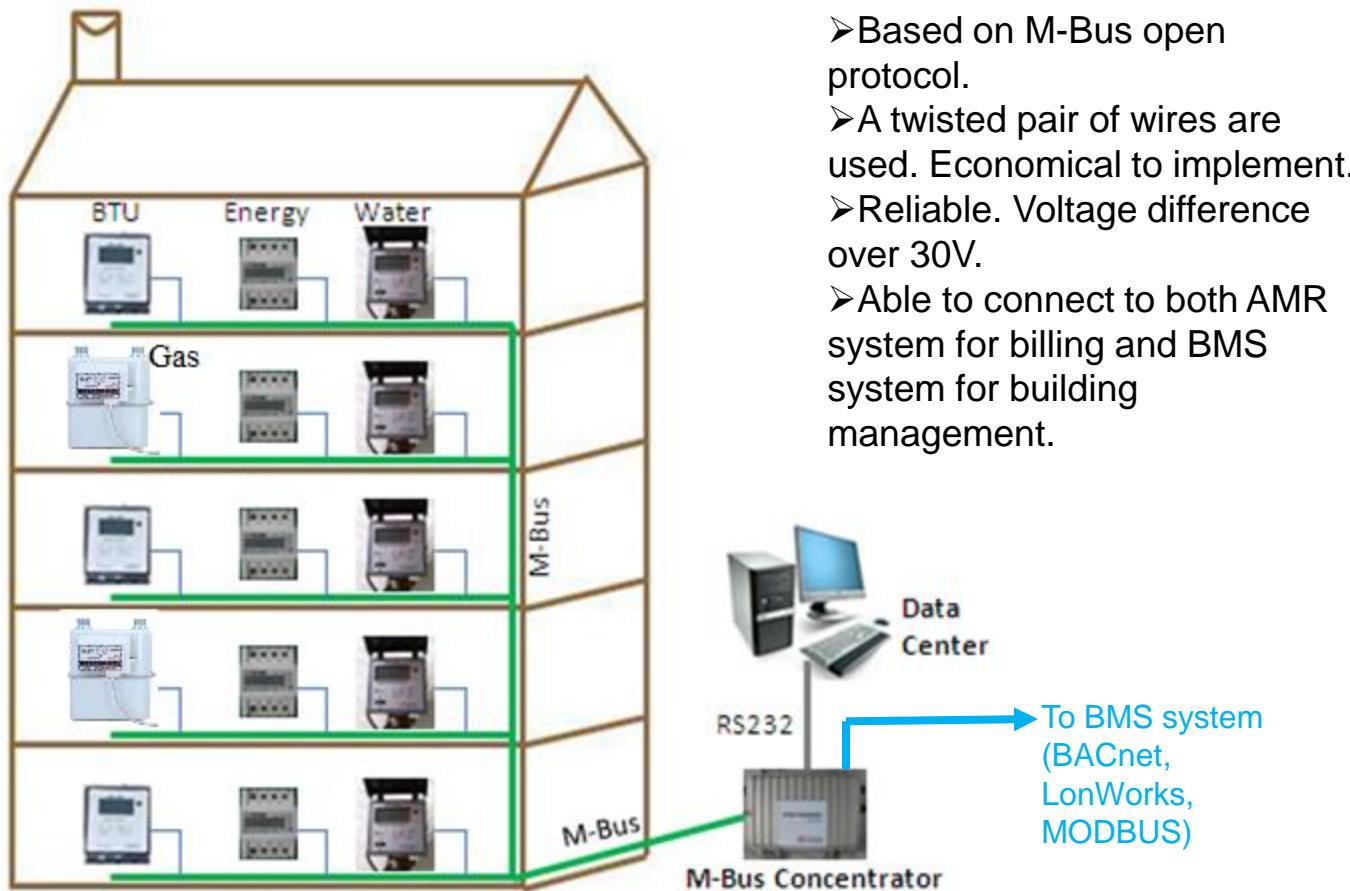
- 1. Metering Reading System - AMR/AMI & Mobile Reading**
- 2. Data Center Hardware Platform**
- 3. Data Center Software Platform**



# 1. METER READING SYSTEM

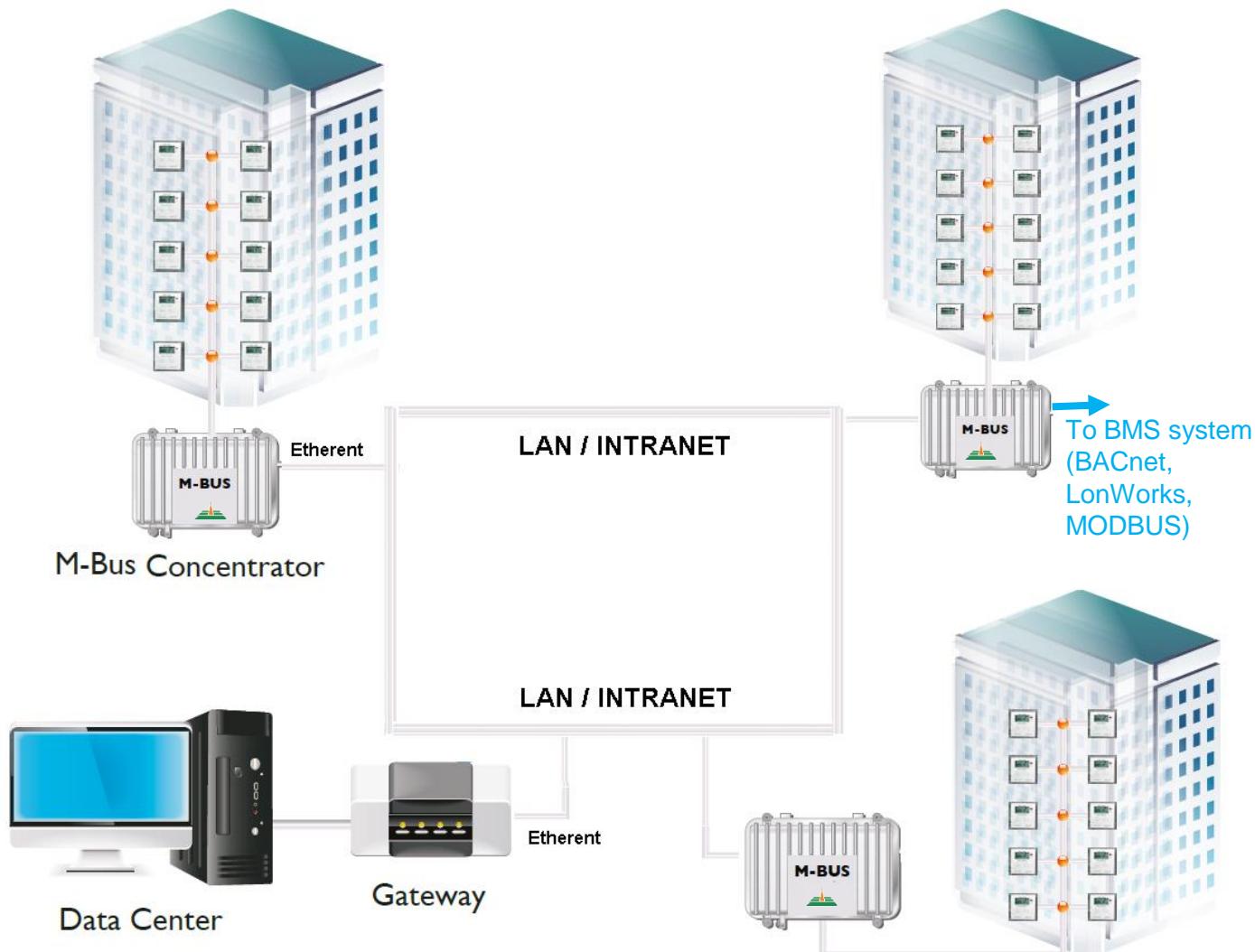
## 1.1. Fixed AMR/AMI System

*M-Bus based. Low cost. Reliable. Fast.*





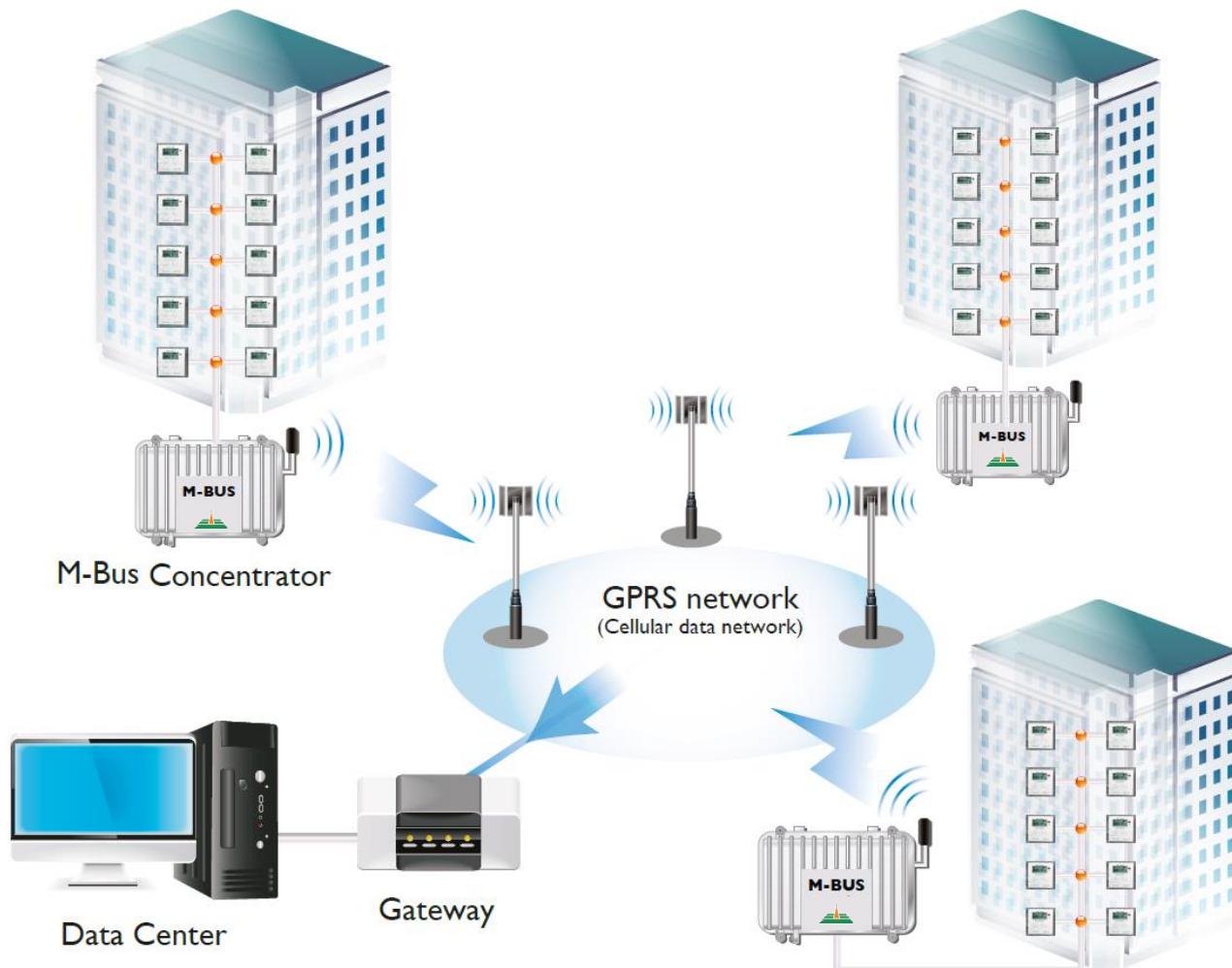
## 1.1. Fixed AMR/AMI System (cont.)



- Utility meters inside a building are daisy-chained to a M-Bus concentrator through a two-wire M-Bus
- M-Bus concentrator reads data from utility meters and transmits data to remote data center through Ethernet (LAN or INTRANET)



## 1.1. Fixed AMR/AMI System (cont.)



- Utility meters inside a building are daisy-chained to a M-Bus concentrator through a two-wire M-Bus
- M-Bus concentrator reads data from utility meters and transmits data to remote data center through GSM/GPRS



## 1.1. Fixed AMR/AMI System (cont.)

This Advanced Metering Infrastructure (AMI) System Offers Numerous Advantages and Capabilities:

- Two-way communication
- Unlimited flexibility
- Reduce overhead costs and enhance customer service
- Increased efficiency on automatic metering reading
- Remote device management
- Improves the process of managing demand for electricity, water, heat/cold energy and gas.
- Offers utility companies valuable insight into customer usage

# 1.2. Mobile Reading System



**RF Frequency:**  
433, 470, 867, 868  
or 915MHz

**End point:**

Water meter



Gas meter



**Mini Repeater:**

For hiding spot only



**Mobile Reader**

A Tablet PC with a USB wireless transceiver



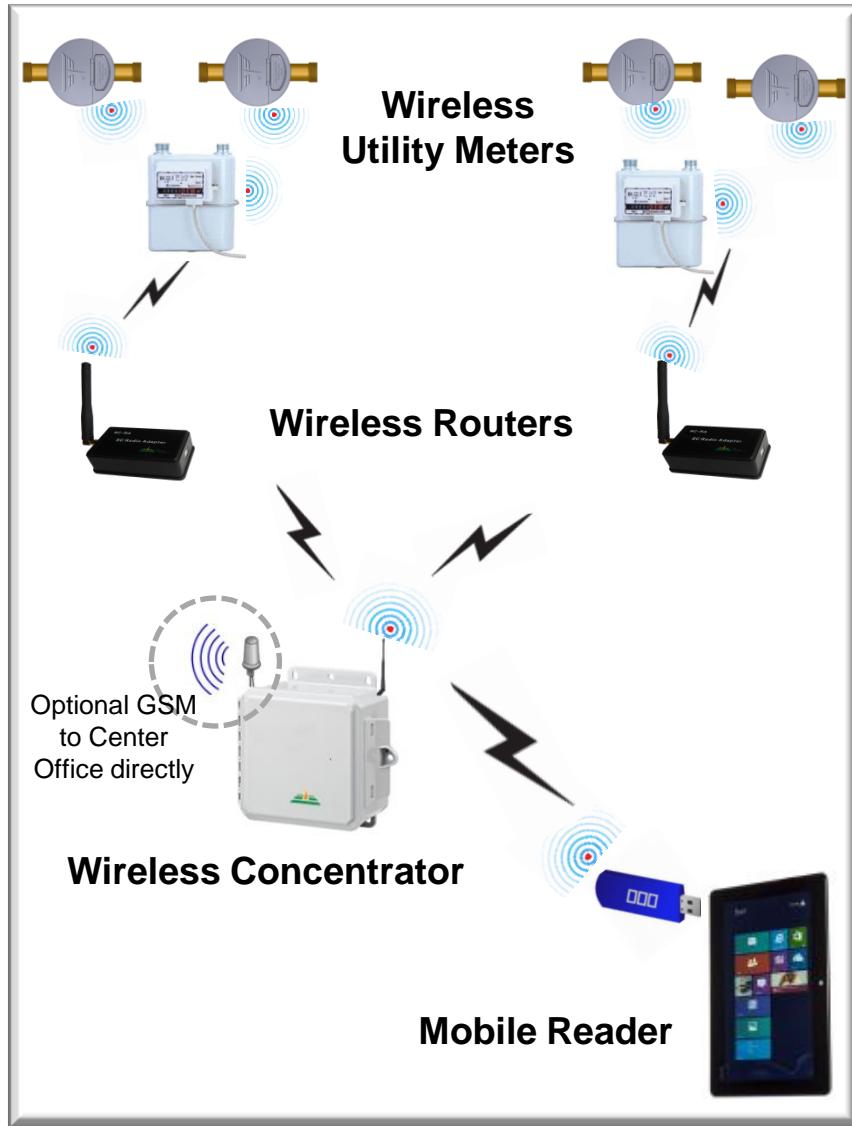
- Each utility meter (water/gas/electricity) has a RF module (endpoint). It sends data and alarm message every 14s;
- Mobile Reader catches the message, either walk-by or drive-by;
- Data can be sent to center office immediately or download later.





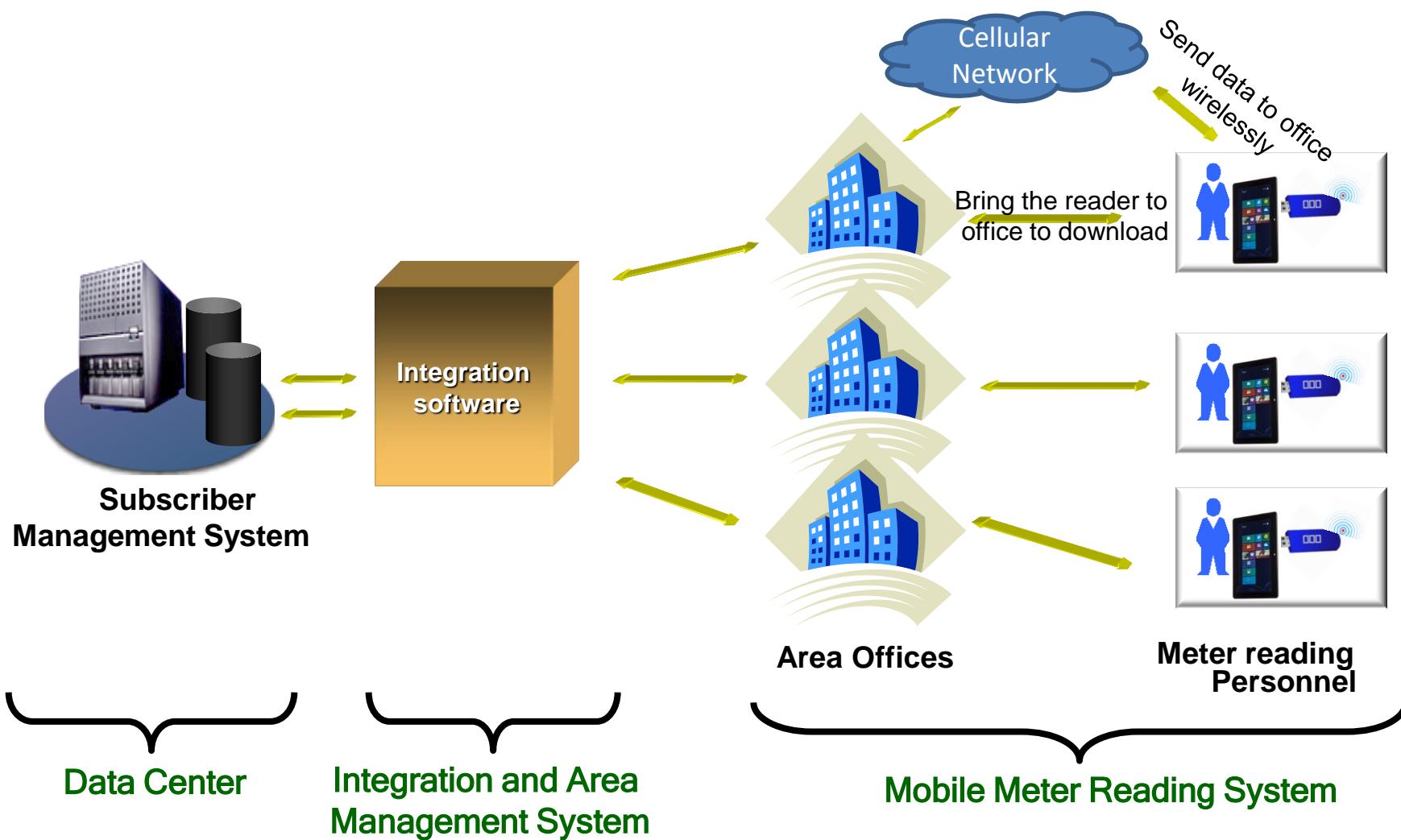
# For high-rise building:

- All meters will send data and alarm messages to wireless concentrator through router;
- Mobile Reader download the messages from the concentrator through wire or wireless.





# Mobile Reading Procedure

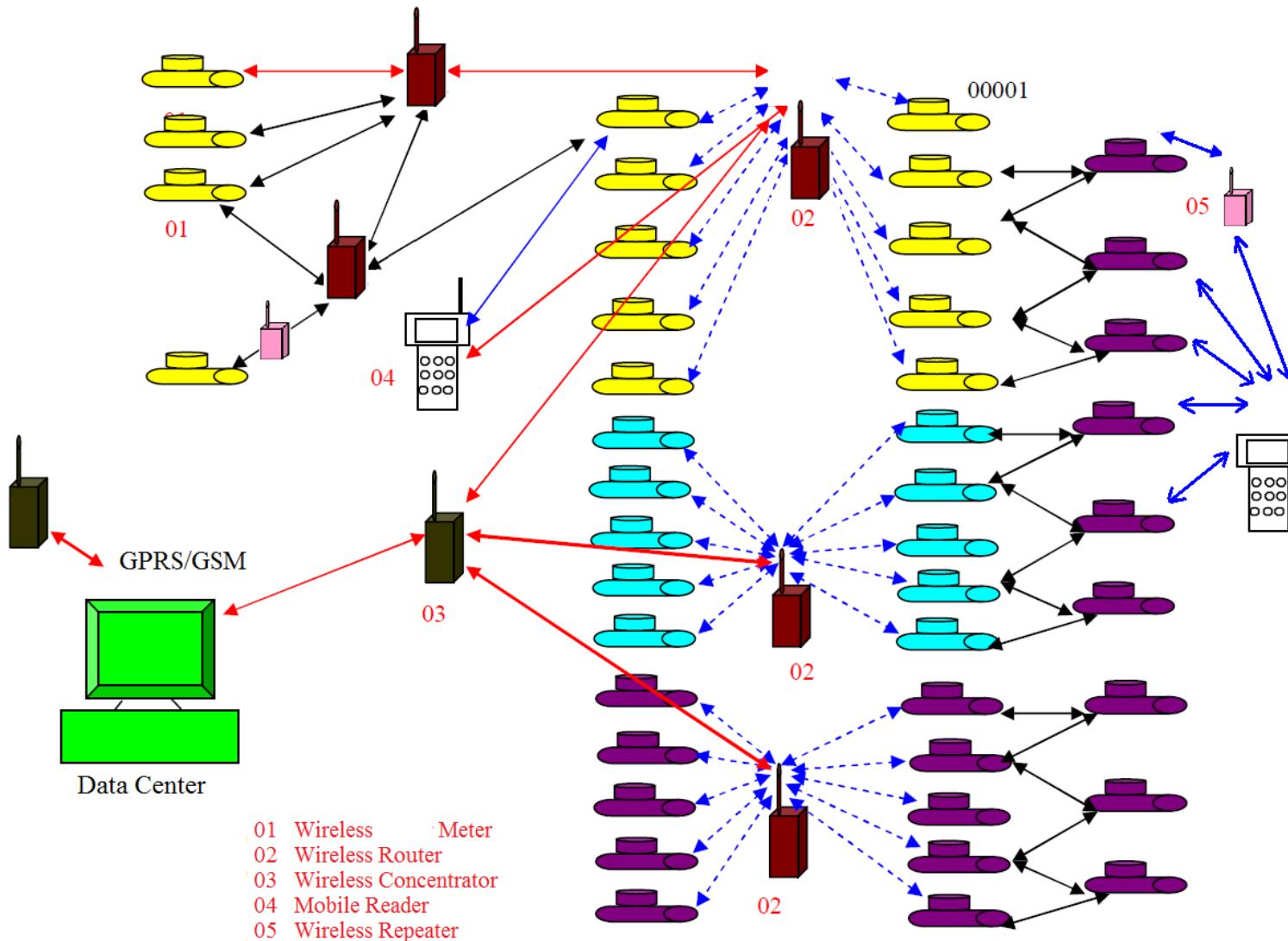


*Note: for software details, please refer to later slides*



# 1.3. Hybrid Meter Reading System

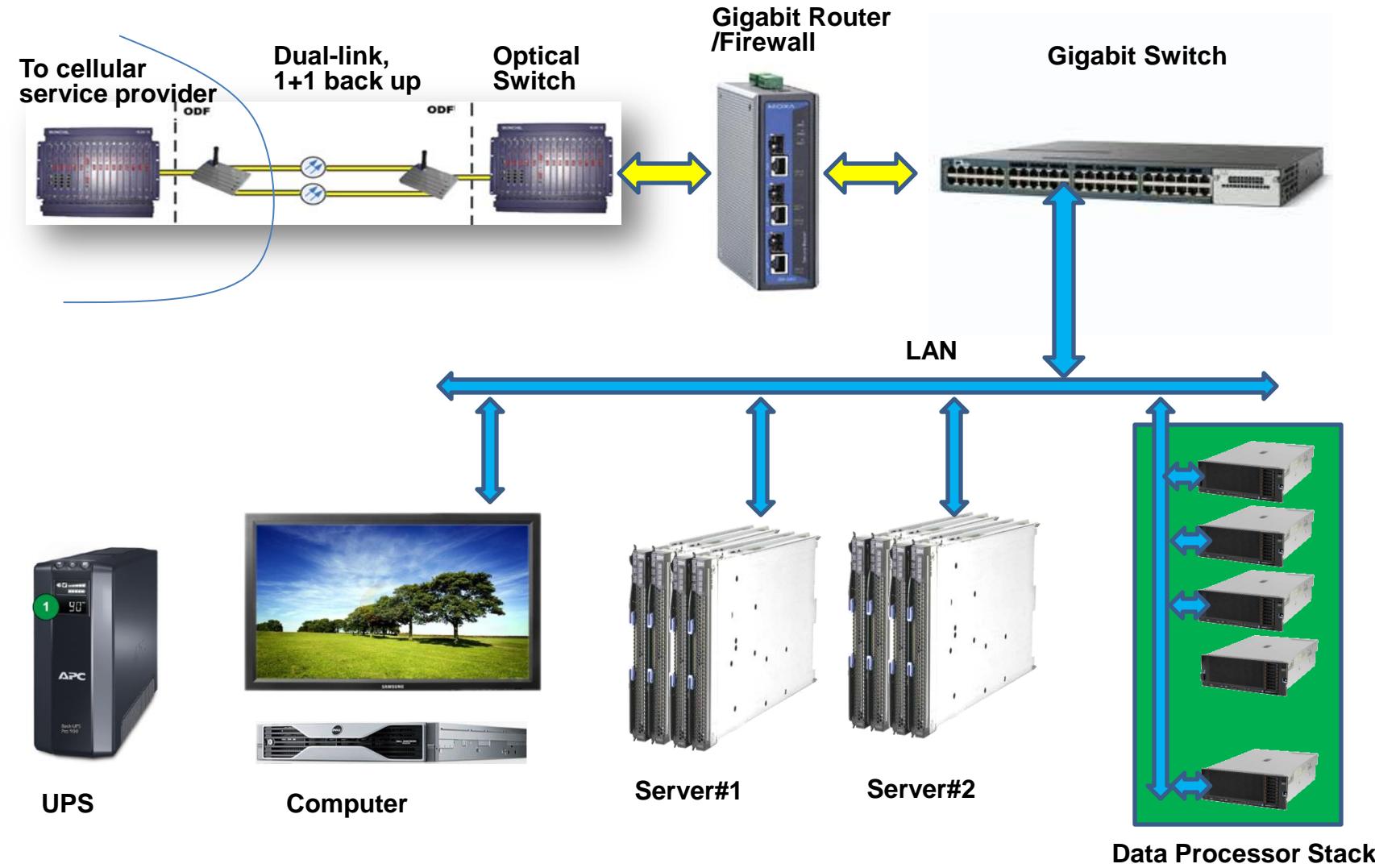
A flexible system seamlessly integrates mobile reading and fixed AMR





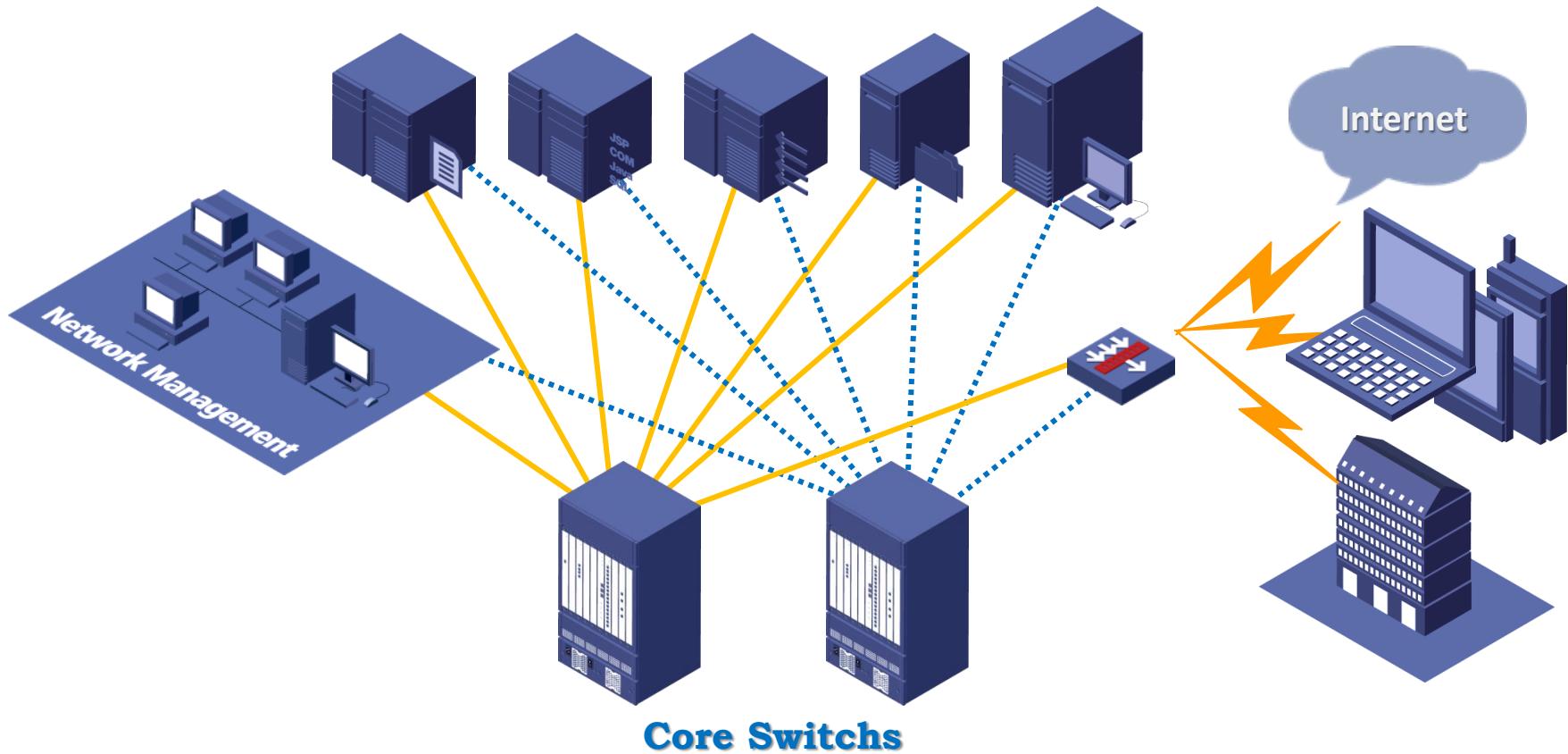
## 2. DATA CENTER HARDWARE PLATFORM

### High Availability





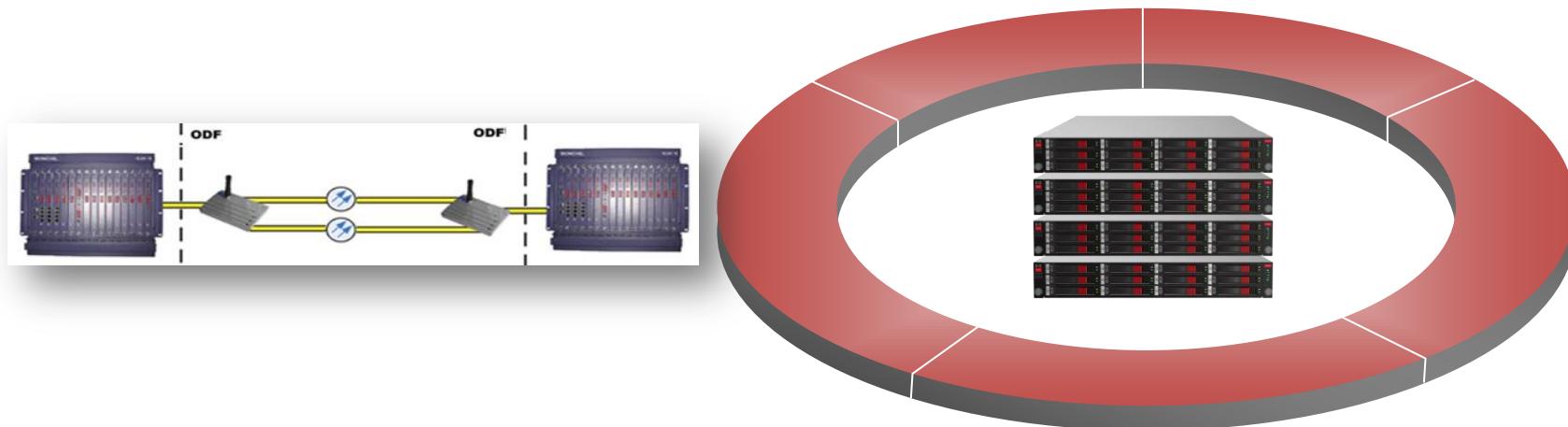
## iotWare® app. Servers group with middleWares





# High Availability

- ❑ N+n Backup in device, access, middleware and core modules
- ❑ Fail over, SMS and email notice, isolated fault nodes
- ❑ Load balance modules (optional)
- ❑ Non Stopservice in IDCs
- ❑ Propose dual-link between core zones
- ❑ High availability included:
  - Device designed and manufactured
  - Communication efficiency and protocol implementation
  - Fault discovery as early as possible
  - Reliable data processors
  - Distributed design and support





# IBM BladeCenter HX5 Server

Scalable blade server enables standardization on same platform for two- and four-socket server needs for faster time to value, while delivering peak performance and productivity in high-density environments.

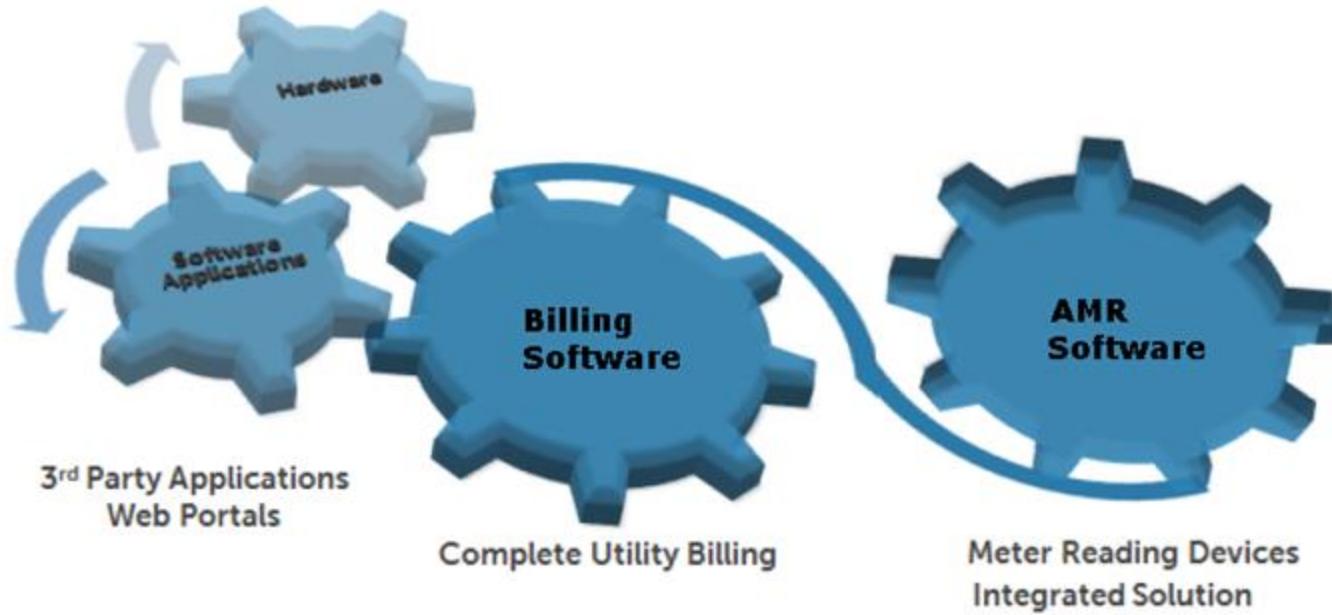
- Scalable 2 socket Blade
- Up to 80 DIMMs with MAX5
- Latest NHM – EX processor
- FlexNode



System Specifications	
<ul style="list-style-type: none"><li>✓ 2x Xeon 7500 and 6500 series CPUs (4C/6C/8C)</li><li>✓ 16x DDR3 VLP DIMMs</li><li>✓ MAX5 memory expansion to 40 DIMM</li><li>✓ Scalable to 4S, 32 DIMM or 4S, 80 DIMM</li><li>✓ UP to 16 I/O ports and to 2x SSD</li><li>✓ Optional RAID 5 with battery backed cache</li><li>✓ Optional 10GB Virtual Fabric Adapter / FCoEE</li><li>✓ Internal USB for embedded hypervisor</li><li>✓ IMM, uEFI, and IBM Systems Director</li></ul>	



### 3. COMPLETE SOFTWARE PLATFORM

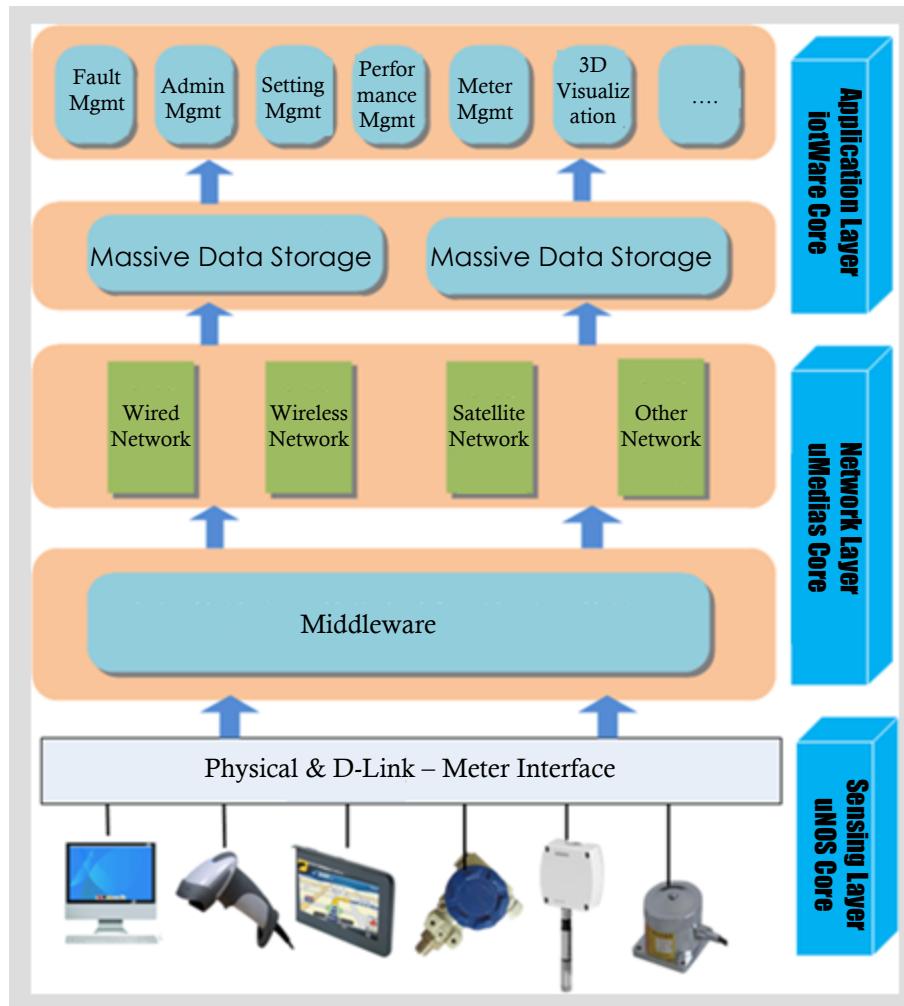


**Provide a complete, integrated environment, combining the best AMR software and billing software**



# AMR SOFTWARE ARCHITECTURE

Open, Flexible, Scalable, Reliable

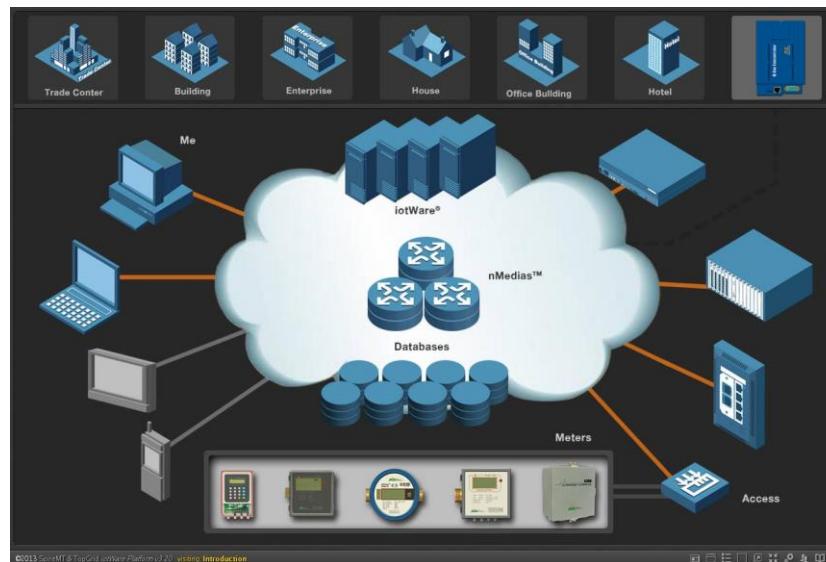




## Software Platform Introduction

SpireCapture software platform is a flexible and reliable open system for meter data management and customer profile management. Its architecture is consisted of 3 layers: a uNOS-based sensing layer to interface with various meters, a nMedias-based network layer to manage multi-protocol data exchange, an iotWare-based open, cross-platform application support layer.

SpireCapture uses the state-of-the-art technologies in cloud computing, high reliability data management and 3D visualization.





# Data Management from Web

English ▾

## Advanced SpireMT MMS Based on iotWare®

Best Solutions For You



The login form features fields for username ('admin') and password ('\*\*\*\*\*'), a 'remember me' checkbox, and a green 'Login' button. Below the form is a link to register and a password recovery link.

Log in

admin

\*\*\*\*\*

remember me

**Login**

You don't have an account yet? [Register here](#)

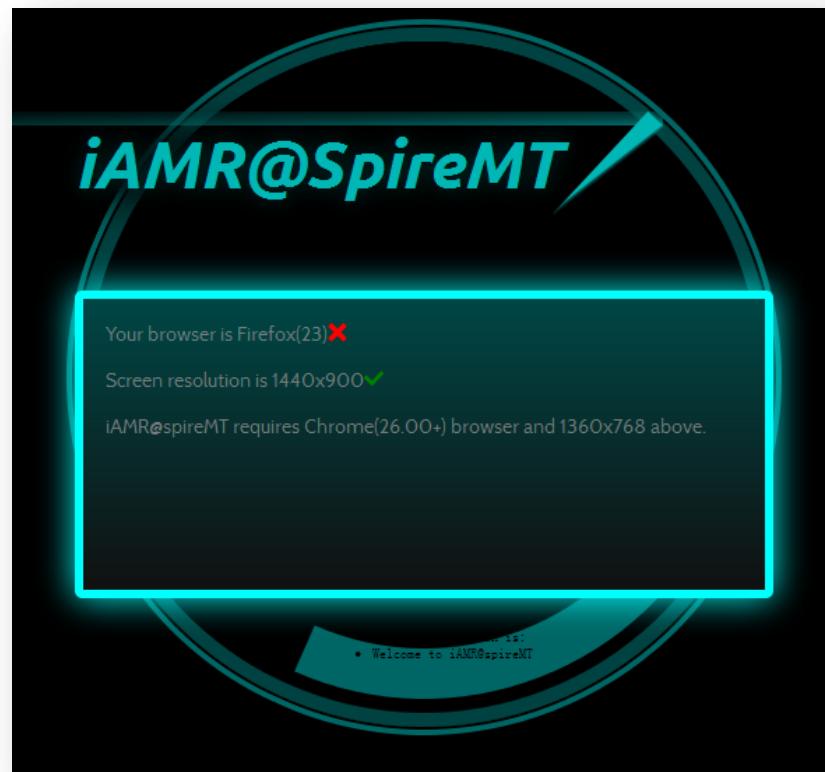
Forgot your password?

Best support for sponsored by

- main
- about us
- our work
- services
- login



# Security policy: different level of authorization has different access capability





# Automatic meter reading at scheduled time and frequency

16:24:20  
Mar/29/2013 Fri

admin1  
Logout

**Administrator** 150  
**Master** 348  
**History** 152  
**Meter Reading** 20  
Read Single Meter 19  
Automatic Meter Reading 96  
**Valve** 222  
**Database** 2  
**Virtual(3D)** 127  
**Other** 147

**Concentrator**  
choose a concentrator ▾

**Customer**

index	ClientName	AccNo	BldgNo	Room	PhoneNo	MobileNo
1	abrhams	6115100723355896435			010-6523456	13652647892
2	Alice	5231656489380315254			010-6524529	13652647246
3	anne	5871299557808013920			027-246437530	13920101573
4	Betty	6220066233558287014			027-61233983	13910059861
5	Bob	6885100723355894568			0756-6556456	18052634892
6	Bruce	622584622394222			010-58946238	13911996222
7	Carmen	52234800111203250823			027-27558403	15920230065
8	Chris	8023651658947865432			010-54687923	15642398715
9	Christina	6221651658947865432			010-54687923	15642398745

Showing 1 to 20 of 30 entries

First Previous 1 2 Next Last

Auto Enable  Auto Disable

**Schedule** ⓘ

After 00:MM:00 mins

Daily HH:MM:SS

Weekly weekly HH:MM:SS

Monthly monthly month



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# Supervise the status of the concentrators and the meters

16:36:16  
Mar 29/2013 Fri

admin1 Logout

**Administrator** 150

**Master** 349

- Concentrator Master 18
- Customer Master 9
- Meter Master 7
- Meter View 9
- Import-Export Meter Master 7
- Meter Allocation 8
- ON-OFF Status 8

**History** 153

**Meter Reading** 20

**Valve** 222

**Database** 2

**Virtual(3D)** 127

**Other** 147

**AccessShow** 20 entries

Concentrator Name	Concentrator Type	Port Settings	GSMPhoneNo.	Remote Location	Status
00162030	AN120	0	0	0	on
00164020	AN120	0	0	0	on
00165020	AN120	0	0	0	on
00165021	AN120	0	0	0	on
00165022	AN120	0	0	0	on
00165023	AN120	0	0	0	on
00165024	AN120	0	0	0	on

Showing 1 to 13 of 13 entries

**MeterShow** 20 entries

index	Meter No	Meter Type	Concentrator No	Concentrator Name	MBUS_Addr
1	31252101	oil	00165021	00165021	1
2	31252102	oil	00165021	00165021	2
3	31252103	oil	00165021	00165021	3
4	31252104	oil	00165021	00165021	4
5	31252105	oil	00165021	00165021	5
6	31252106	oil	00165021	00165021	6
7	31252107	oil	00165021	00165021	7
8	31252108	water	00165021	00165021	8
9	31252109	water	00165021	00165021	9
10	31252110	-	00165021	00165021	10

Showing 1 to 20 of 21 entries (filtered from 234 total entries)

**W-Bus Concentrator**

**IPulse™ 200T**



# Meter and customer information can be easily uploaded with XML

16:55:56  
Mar 29/2013 Fri

administration

admin1  
Logout

spireMT

- boston
- test1
- test2
- namea
- namee
- shanghai
- tianjin
- chongqing
- chengdu
- test3

1.Create a new project 2.Upload licensed files 3.Generate basic tables 4.Device layout 5.Progress memo 6.Diagnosis

### Upload CHONGQING products licensed files:

File Upload with multiple licensed selection, drag&drop support, progress bars, validation and preview images. Supports cross-domain, chunked and resumeable uploads operation.

+ Add files...    ⏪ Start upload    ⏹ Cancel upload    ⏷ Delete

unaccess.xml	8.79 KB	<span style="background-color: red; color: white; padding: 2px 5px;">Delete</span>
unmeter.xml	10.26 KB	<span style="background-color: red; color: white; padding: 2px 5px;">Delete</span>
unproduct.xml	13.67 KB	<span style="background-color: red; color: white; padding: 2px 5px;">Delete</span>

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# The customer information can be added, edited, searched, removed in the tables

16:33:46  
Mar/29/2013 Fr

admin1  
Logout

index	ClientName	AccNo	Country	City	District	Street	Bldg	FloorNo	Room
1	abrhams	6115100723355896435	China	Beijing	Haidian	Zhongguancun	0	3	3-1-2
2	Alice	5231656489380315254	China	Beijing	Fangshan	Dadongcun	0	2	2-1-1
3	anne	5871299557808013920	China	Wuhan	Wuchang	Luoyulu	0	20	20-3-2
4	Betty	6220066233558287014	China	Shanghai	Wuchang	Luxiang	0	13	13-1-3
5	Bob	6885100723355894568	China	Zhuhai	Xiangzhou	Gangwan	0	5	5-2-1
6	Bruce	622584622394222	England				0	0	
7	Carmen	52234800111203250823	China	Wuhan	Wuchang	Zhongnan	0	11	11-3-6
8	Chris	8023651658947865432	China	Beijing	Chaoyang	Zhongchuang	0	15	15-4-6
9	Christine	6221651658947865432	China	Beijing	Yizhuang	Rongchang	0	12	12-3-7

Showing 1 to 20 of 30 entries

First Previous 1 2 Next Last

Administrator 150  
Master 349  
Concentrator Master 17  
Customer Master 8  
Meter Master 7  
Meter View 8  
Import-Export Meter Master 6  
Meter Allocation 7  
ON-OFF Status 7  
History 153  
Meter Reading 20  
Valve 222  
Database 2  
Virtual(3D) 127  
Other 147

Full name: anne  
Floor no: 20  
P.O.box:  
District: Wuchang  
Street no:  
Street name: Luoyulu  
City: Wuhan  
Province: province  
Country: China  
Postal code:  
Gross Area:  
Reset

In Date: Check in date  
Building no: 0  
Account no: 58712995578080139  
Telephone no: 027-246437530  
Cell phone: 13920101573  
Alt telephone no: alternate telephone n  
Fax no: fax no  
E-mail: anne520@163.com  
Contact person: contact person  
Create: Submit  
Reset

Sex: man woman  
chose a photo  
IPrint™ 280T  
Ultrasonic Heat Meter  
• Power: 7.5W~9W • PT 1000  
• IP: 55 ~ 95 mV  
• Accuracy: ±0.5% F.S.  
• Temperature Range: -40°C ~ 120°C  
• Water Class: 2  
Model 280T DIN 13  
Manufactured by  
CE  
ISO 9001  
ISO 14001  
ISO 18001

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# Web Data Presentation

Customer Login

Customer Login

Login Name: D-markr  
Password: \*\*\*\*\*

Remember Me:

Click for new user Registration: [Register](#)

Forgot your password?: [Reset Password](#)

Spire AMR

Advanced-Data [Site 136 (SPIRE\_TEST)]

Navigation Site Selection Logout Help

Date Range Filters Output Technical

Select Date Range and Data Filter

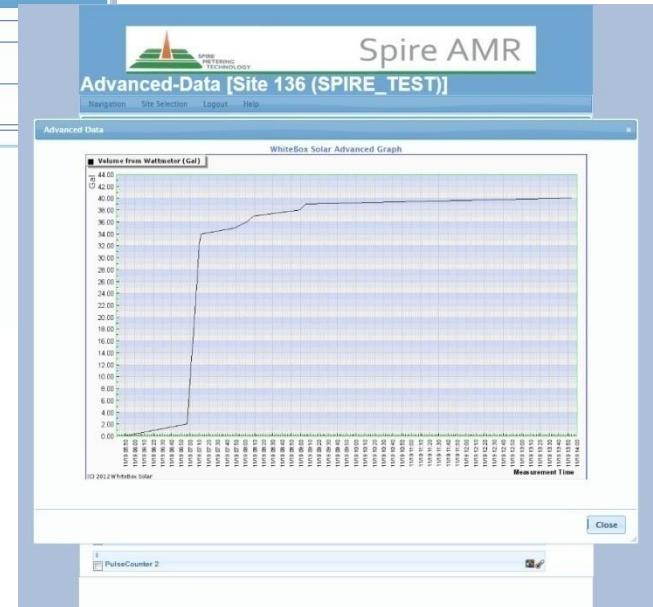
Quick Select Today (11/19/2012) FROM 11/19/2012 00:00 TO 11/19/2012 23:59

Data Filter Autorange (default)

Select Device from list\*

Select Device from list

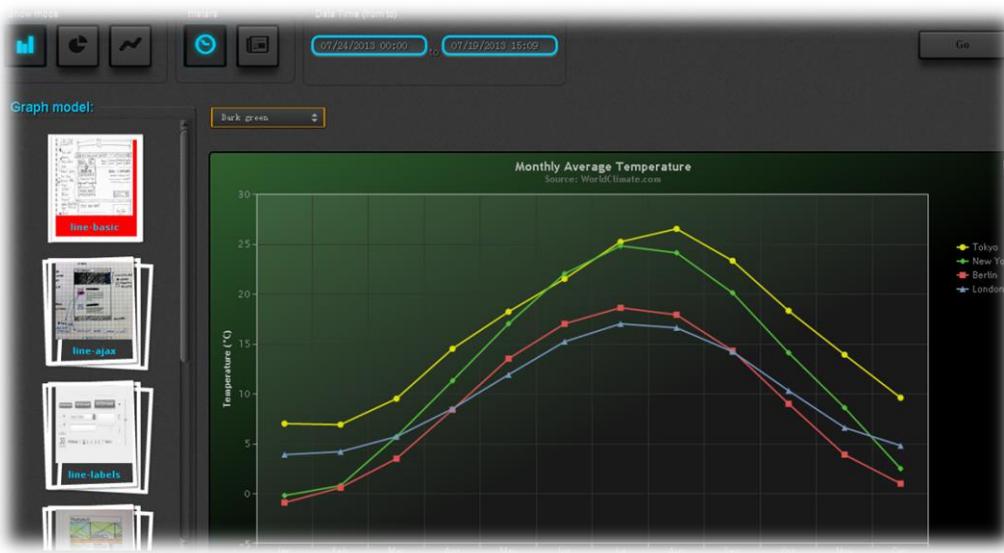
STUF-300F(1001)  
Metrima F2(9574771)  
SpireMetering STUF-280T(404898629)



**Customer can explore not only the meter current data, but also many other useful information: meter status, history, usage trend, etc.**



## Data mining function provides utility company an effective way to manage water resources and discover potential loss





# Extract real-time data from the database for billing purpose

15:47:01  
Mar 29/2013 Fri

admin1  
Logout

**Administrator** 150  
**Master** 348  
**History** 152  
Meter History 34  
**Export Data for Billing** 38  
**Meter Reading** 19  
**Valve** 222  
**Database** 2  
**Virtual(3D)** 127  
**Other** 147

**Result show**  
 All Meters  Gas  Water  Heat  Oil  Electricity  
Date Time (from to)  
03/01/2013 to 03/29/2013 **Search**

Meter Type	Meter Serial No	DateTime	reading	Meter Unit
electricity	31252908	2013-09-21 13:57:07	0	unknown
electricity	3125290B	2013-09-21 13:57:34	0	unknown
electricity	3125290E	2013-09-21 13:58:01	0	unknown
electricity	3125270E	2013-09-21 15:43:42	0	unknown
electricity	3125220D	2013-09-21 15:49:28	0	unknown
electricity	3125230A	2013-09-21 16:38:32	0	unknown
electricity	3125230B	2013-09-21 16:38:46	0	unknown
electricity	3125250B	2013-09-21 17:07:16	0	unknown
electricity	31252909	2013-09-21 13:57:16	0	unknown
electricity	3125220E	2013-09-21 15:49:29	0	unknown
electricity	3125230C	2013-09-21 16:38:32	0	unknown
electricity	31252610	2013-09-21 16:46:46	0	unknown
electricity	31252612	2013-09-21 16:48:45	0	unknown
electricity	31252614	2013-09-21 16:50:45	0	unknown
electricity	31252508	2013-09-21 17:00:50	0	unknown
electricity	3125250A	2013-09-21 17:05:08	0	unknown
electricity	3125250E	2013-09-21 17:13:44	0	unknown
electricity	3125290A	2013-09-21 13:57:25	0	unknown
electricity	3125290C	2013-09-21 13:57:43	0	unknown

Showing 1 to 20 of 218 entries **First** **Previous** 1 2 3 4 5 **Next** **Last**

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Print View Export PDF Print View Export PDF



# Easy access to event logs

09:48:19  
Mar30/2013 Sat

administration

1. Create a new project 2. Upload licensed files 3. Generate basic tables 4. Device layout 5. Progress memo 6. Diagnosis

3D 2011.1 2011.2 2011.3 2011.4 2011.5 2011.6

2011.2

A meeting on the specific subject was held to organize and implement the Project Quality Plan, and created the meeting minutes. The Project Quality Plan shall be particularly enforced and the Chief Supervision Engineer will be responsible for the conformance of the implemented results. Under the leadership of the Chief Supervision Engineer, the QA Engineers will be liable for the definition work of the construction quality control.

Date time 03/11/2011 17:17

Description

The revision or additional comments on the Construction Quality Plan submitted by the construction subcontractors was put forward, submit it to Chief Supervision Engineer for approval after it was re-reviewed. Then QA engineers supervise and measure the implemented conformance on the quality assurance provisions which stated in the Construction Quality Plan of construction subcontractors.

choose a photo

Record

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Navigation icons: back, forward, search, etc.



# Graphic Visualization with 3D Model



**Spire Metering can design customized 3D model for intuitive graphic visualization**



17:32:57  
Sep 30/2013 Mon

admin1  
Logout

**Administrator** 147

**Master** 340

**History** 147

**Meter Reading** 16

**Valve** 222

**Database** 2

**Virtual(3D)** 128

Panorama & StreetView 34

Perspective & Indoor 37

**Other** 147







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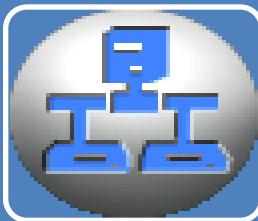


# Graphic Visualization with Geographic Map





# Eight management functions



## Topology Management

Discover metering system topology automatically



## Performance Management

Replay history curve and track . Able to compare sample data from various devices synchronously



## Real-time Monitoring

Data monitoring in real time . Intuitive data presentation with dynamic data charts and curves



# Eight management functions (cont.)



## Configuration Management

Easy to configure the devices, network, AMR system, database, management and environment health



## Fault Management

Monitor alarms (theft, over limit, etc.), operating status, system environment conditions, failure locations, tracking



## Server Management

Easy to manage the server configuration and operation. Manage report forms, data mining , intelligent analysis

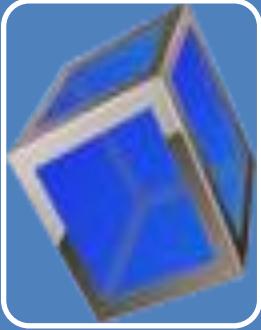


## Eight management functions (cont.)



### Security Management

Managing , distributing and verifying the authorization mechanism , access control, encryption key , security log

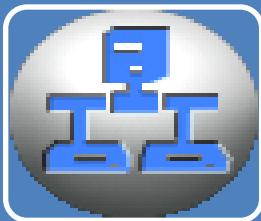


### 3D Topological Function

Virtual reality 3D environment , such as building , room , IDC , etc. All static and dynamic interactive parameters of the devices are supported by the open architecture, highly compatible and modular based design of the software system



# Eight management functions (cont.)



## Topology Management

Discover metering system topology automatically



## Performance Management

Replay history curve and track . Able to compare sample data from various devices synchronously

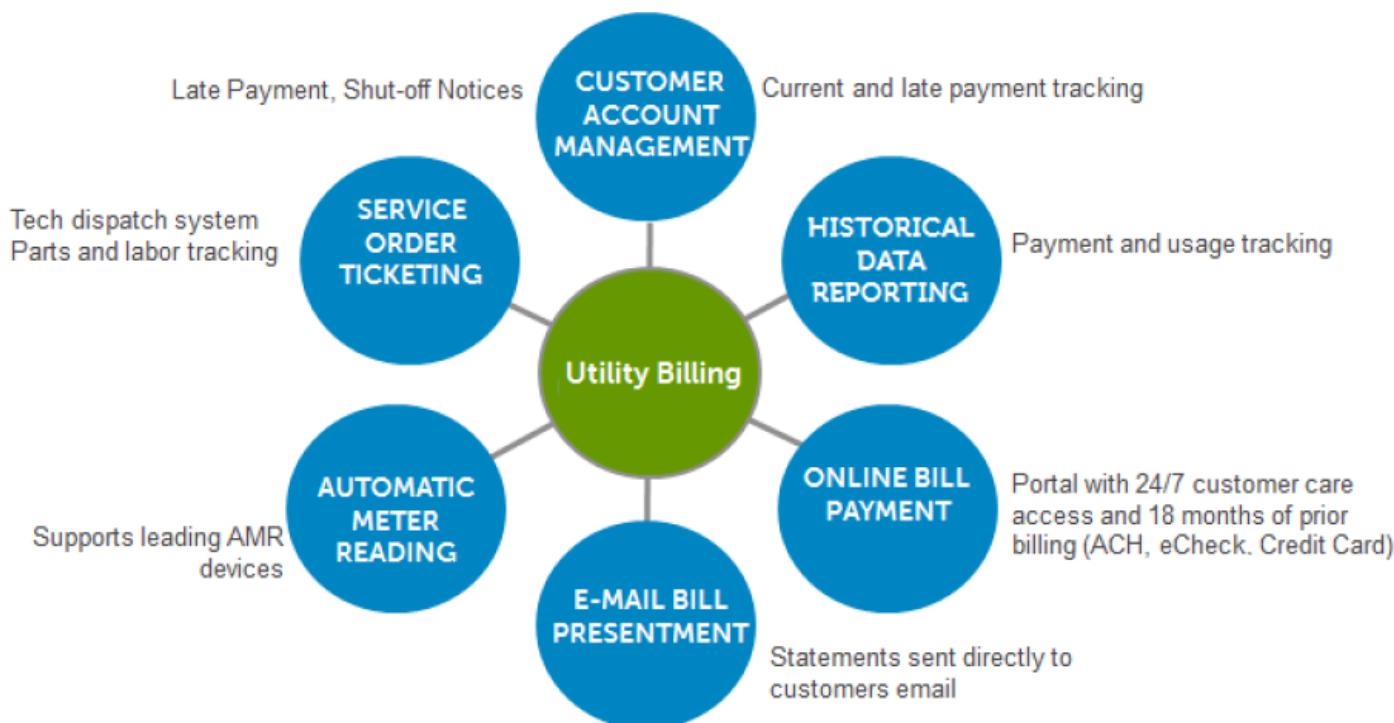


## Real-time Monitoring

Data monitoring in real time . Intuitive data presentation with dynamic data charts and curves



# Billing Solution





## Billing Software Standard Features

-  Automatic Meter Reading – Seamlessly integrated to SpireCapure™ AMR platform
-  Import Meter Readings from MS Excel
-  Secure Multi-user System Access – Create unique login names and passwords for each system user.
-  Printing to Electronic files for service work orders, and statements
-  Integrated Shut-off Notices
-  Miscellaneous Charges or Credits
-  Account Record Log
-  Auto Backup and Archiving