

Ingersoll Rand International (India) Ltd.  
#35, Bidadi Industrial Area,  
Bangalore 562 109

Cell : +91 96111 33700  
[harish.shastri@gmail.com](mailto:harish.shastri@gmail.com)  
<http://blog.hvishwanath.net/>

## Professional Experience

7.5+ years of experience in software industry.

- Lead Software Engineer with Ingersoll Rand ([www.irco.com](http://www.irco.com)) since May 2008.
- Senior Software Engineer, with Computer Sciences Corporation ([www.csc.com](http://www.csc.com)) from July 2005 to May 2008

I specialize in development of connected controls and applications in Python, C/C++.

## Achievements

- **President's Award** in the category of Innovation (Market Impacting), 4Q 2012, Ingersoll Rand
- **President's Award** in the category of Growth, 4Q 2012, Ingersoll Rand
- **President's Award** in the category of Dramatic Growth, 4Q 2010, Ingersoll Rand
- **President's Award** in the category of Inspiring Progress, 4Q 2009, Ingersoll Rand
- **Performer of the Year** award, 2010, Ingersoll Rand
- **Performer of the Quarter** award, Q3 2009, Ingersoll Rand
- Obtained "Disclosure Awards" in Ingersoll Rand for :
  - o Encryption technique for iButton family of Credentials
  - o Using visible light to transmit credential data.
  - o Finger swipe credential for electromechanical locks
  - o A transport and application level protocol using "Websockets" to enable data transmission and communication in remote monitoring solutions
- **Employee of the Year 2006-07**, CSC India
- **Finalist of "Technical Excellence Award"**, CSC India – 2007.
- Recipient of **Foundation For Excellence** scholarship for the entire course of my graduation.
- Class topper during my graduation (BE) and pre-university (12<sup>th</sup> grade).
- Consistently rated "Exceeds Expectations" during performance appraisals in Ingersoll Rand

## Education

B.E (Information Science), year of 2005, from JSSATE Bangalore. **Aggregate : 81.07%. Class Topper.**

## Technical Skills

Applications programming	Python, Java, J2ME, C++, VC#, Test driven development
Web/Internet programming	Python, Django, Web2Py, Google app engine
Embedded systems programming	PIC series Microcontrollers, Embedded C/C++, Embedded Linux development
Protocols	BACnet, MODBUS, XMPP, XMLRPC, NFC, Mifare
Domain expertise	Security systems, HVAC controls, Remote Monitoring and Energy Management

## Projects – Highlights

### 1. [Remote management services](#)

Embedded Linux based controller capable of acquiring data over BACnet/IP, Modbus and CAN networks supporting bidirectional command/control and data transfer via custom protocol built over XMPP. **Won President's Award for Innovation for this project.**

### 2. [Unitary Controller for Light Commercial HVAC Unit](#)

Unitary controller featuring 2.2 inch TFT display, capacitive touch buttons, and contemporary industrial design. Sophisticated features such as 'Intelli mode', energy efficient algorithms, dual compressor control, load balancing, fault enunciation etc., were supported.

### 3. [Remote analysis of Zigbee traffic](#)

Complete solution consisting of an embedded controller passively capturing zigbee traffic from IR products and sending it to a remote server. The remote server ran a web application capable of parsing and analyzing this information and produced reports, statistics and graphs offering insights into the workings of IR product. **Won President's Award in the category of Growth for this project.**

### 4. [Small Commercial Converged Controller](#)

Embedded Linux based controller offering converged capabilities of 4 door access control, I/O control, Lighting/HVAC control, fire panel and energy meter integration, advanced scheduling, events and reporting features.

### 5. [Converged buildings demo for ACREX](#)

Developed integrated control platform using BACnet as a backbone for communications enabling different controls in a building to offer coordinated building responses and intelligent energy savings.

### 6. [Hybrid Key applet](#)

Java applet capable of encoding a Mifare 1k/4k cards with required credential data enabling customers/channel partners to securely encode their credentials over internet.

### 7. [Schlage Utility Software](#)

Full fledged windows application capable of configuring and managing Schlage family of electromechanical locks.

### 8. [NFC Mobile phone based credential](#)

J2ME mobile app for Nokia 6212 classic NFC phone enabling the usage of mobile phone as a credential for IR electromechanical locks. **Won President's Award in the category of Dramatic Growth for this project.**

### 9. [Low power Wi-Fi for IR locks](#)

Integration of Low power Wi-Fi chip from Gainspan with IR electromechanical locks thus enabling TCP/IP connectivity, direct authentication from enterprise apps without the need for an access control panel.

### 10. [Silverline – Optical credential platform](#)

Proof of concept demonstrating the viability of bi-directional transfer of credential data between Lock and credential over visible/infrared light.

### 11. [GT400 Biometric hand reader development](#)

Python application development using SQLAlchemy for seamless transition from OODB to RDBMS platform to improve storage and responsiveness of the system. Embedded linux platform development to include over 24 complex libraries such as PyGTK, ZODB, OpenSSL etc.,

## Projects – Overview

Ingersoll Rand Engineering Centre, Bangalore

May 2008 - present

### Remote Management Services (Jun 2012 – Present)

Description	<p>Ingersoll Rand launched Remote Management solution in partnership with IBM.</p> <p><a href="http://goo.gl/8VM2G">http://goo.gl/8VM2G</a>  <a href="http://goo.gl/vJlrT">http://goo.gl/vJlrT</a>  <a href="http://goo.gl/613Sl">http://goo.gl/613Sl</a></p> <p>I led the development of a Linux based controller capable of acquiring data over multiple networks and transmit it securely over internet.</p>
Technology	Embedded Linux, BACnet, Modbus, Python, C/C++, XMPP
Responsibilities	<p>End to end design and development of “Connectivity Module” which is a linux based controller capable of acquiring data over BACnet/IP, Modbus and CAN networks. Implements bidirectional command/control and data transfer with remote server via custom protocol built over XMPP. It offers sophisticated features such as Over the air (OTA) firmware and configuration update.</p> <p>Responsible for hiring and putting together a development team. Delivered the entire solution in less than 5 months with zero critical defects.</p>
Role	Technical Architect and Development lead. Built a team of 6 high performance engineers and oversaw software development.
Impact	Connectivity Module is a key component in Ingersoll Rand’s remote management services offering. We received <b>President’s Award</b> in the category of Innovation (Market impacting) for the high quality work delivered.

### Unitary Controller for Light Commercial HVAC Unit (Mar 2012 – Jun 2012)

Description	Ingersoll Rand is offering a localized version of its “Odyssey” series Light Commercial HVAC Unit in Indian market. Develop a unitary controller for the unit.
Technology	TFT display, PIC controllers, Cap sense, Embedded C
Responsibilities	As a project lead, led a team of 3 engineers to develop a unitary controller for Ingersoll Rand’s LCU offering in India. The controller features a 2.2 inch TFT display, capacitive touch buttons, and contemporary industrial design. Sophisticated features such as ‘Intelli mode’, energy efficient algorithms, dual compressor control, load balancing, fault enunciation etc., were supported.
Role	Project lead.
Impact	Managed multiple vendors for hardware design and platform selection. Delivered the controller well under the cost target of Rs. 2500 INR.

<b>Remote analysis of Zigbee traffic (Jan 2012 - Feb 2012)</b>	
Description	Ingersoll Rand launched residential solutions business with Interactive keyless lock, Intelligent AC and Multifunction Remote communicating over Zigbee protocol. Develop solution to remotely monitor and analyze zigbee communications.
Technology	Embedded linux, Beagle board, Python, Web2Py
Responsibilities	Developed an end to end solution in less than a month. The solution consisted of an embedded controller passively capturing zigbee traffic from IR products and sending it to a remote server. The remote server ran a web application capable of parsing and analyzing this information and produced reports, statistics and graphs offering insights into the workings of IR products.
Role	Tech lead. Delivered the complete solution in under a month with the help of a fresh engineer.
Impact	The project offered critical insights into behavior of IR products in the field viz., battery life, key presses, communication failures, customer usage etc., <b>We won President's Award in the category for Growth for this project.</b>  Press coverage : <a href="http://goo.gl/Pm6H4">http://goo.gl/Pm6H4</a> <a href="http://goo.gl/jfG7Z">http://goo.gl/jfG7Z</a>

<b>Small Commercial Converged Controller (Apr 2011 – Dec 2011)</b>	
Description	New product development aiming to develop a converged controller for small to medium businesses for businesses in retail, office spaces, multi-tenant buildings etc.,
Technology	Embedded linux, Python, Django, C/C++, Security and HVAC
Responsibilities	End to end design and development of small commercial converged controller with capabilities of 4 door access control, I/O control, Lighting/HVAC, fire panel and energy meter integration. The controller also has a web based front end which can be used to remotely monitor facilities, manage and control equipment, build schedules and events to achieve energy savings and extract reports for Access control, energy monitoring etc.,
Role	Team lead. Participation starting Gate 0 of NPD. Involved in business case creation, engineering proposal, recruitment, VOC and product development. Managed and mentored a team of 3 fresh engineers to deliver expected results.
Impact	This project led to creation of standard hardware and bsp platforms across IR for upcoming projects. The product is currently being considered for commercialization.

<b>Converged Buildings Demo for ACREX (Jan 2011 – March 2011)</b>	
Description	ACREX is a prestigious yearly exhibition conducted at an all India level. Demonstrate Ingersoll Rand's converged asset management initiative.
Technology	BACnet, XMLRPC, Controls Integration
Responsibilities	Developed an integrated control platform using BACnet as a backbone for communications. Used Tracer SC which is Ingersoll Rand's HVAC system controller and integrated it with Ingersoll Rand's Access control system, Video management system and third party light and fire systems. Built intelligence into the systems to offer coordinated building responses for different triggers.
Role	Tech lead.
Impact	As a result of this integration, we demonstrated how buildings can be made smarter, safer and more efficient by enabling coordinated building responses and intelligent savings. Press coverage below: <a href="http://goo.gl/KkiBH">http://goo.gl/KkiBH</a> <a href="http://goo.gl/wKlIe">http://goo.gl/wKlIe</a> <a href="http://www.expresscomputeronline.com/20110328/news05.shtml">http://www.expresscomputeronline.com/20110328/news05.shtml</a>

<b>Hybrid Key applet (Aug 2010 – Dec 2010)</b>	
Description	Develop web based card encoding application to be used with Ingersoll Rand's CISA hybrid-key platform
Technology	Java applets, Mifare, JNI
Responsibilities	End to end development of a java applet capable of encoding a Mifare card with required credential data. The applet would communicate with the PC's USB card encoder to encode new credentials.
Role	Project lead. Managed a team of two developers.
Impact	This project reduced service related cost incurred by the sector. Customers/Channel partners could now encode credentials from anywhere. Led a healthy engagement with team in Europe leading to more inflow of projects.

<b>Schlage Utility Software (Sep 2010 – Jan 2011)</b>	
Description	Reduce customer costs by developing single configuration/management software for all Schlage family of locks.
Technology	VC#, USB CDC, PIC controllers
Responsibilities	This software initially was developed as a Windows mobile application running on a hand held device. The scope of the project was to develop full-fledged configuration software running on a Windows based PC. I led the end to end delivery of the application with a relatively new team. Successfully solved problems like managed to unmanaged interoperability in .NET framework, USB host to host communication problem etc., We also developed a custom cable for USB host to host communications.
Role	Project lead. Complete SDLC activities along with project management, scheduling and resource allocation. Managed vendor (Microchip) communications and succeeded in obtaining a custom USB-Serial convertor stack.
Impact	Direct cost savings to end customer without needing to buy a separate hand held device.

<b>Near Field Communications – Mobile Phone as a Credential for IR locks (Mar 2010 – Sep 2010)</b>	
Description	The project aimed at developing an innovative and convenient credential platform using an NFC capable mobile phone that can be applied to IR Access control systems.
Technology	NFC, Mifare, Mobile app development using J2ME
Responsibilities	End to end development of “NFC Wallet” mobile application using J2ME for Nokia 6212 classic phone. The application was capable of receiving and storing credential data for multiple locks, encode new Mifare cards and retrieve audit trails from the lock.
Role	Project lead. IRETC Bangalore representative in the global credential team.
Impact	We won the <b><u>President’s award in the category of “Dramatic Growth”</u></b> for this project. This project serves as a foundation for credential technology in many of Ingersoll Rand’s upcoming products.

<b>Low Power Wi-Fi on IR Locks (May 2010 – Jul 2010)</b>	
Description	The objective was to enable IR electromechanical locks with Wi-Fi capability
Technology	Low Power Wi-Fi, VC#, Embedded C Programming, RS232, PIC24F etc.,
Responsibilities	<p>The proposal consists of enabling Wi-Fi networking on IR locks. Did analysis and research pertaining to:</p> <ul style="list-style-type: none"> <li>- Low Power Wi-Fi chips in the market</li> <li>- Power requirement</li> <li>- Transmission Range</li> </ul> <p>Successfully integrated Low Power Wi-Fi chip from a company called GainSpan into IR Nigel Series locks. This demonstrated the viability of Wi-Fi in embedded devices and cost advantages of making our locks Wireless to both the company as well as to the customer. Identified limitations and issues that this approach presents, and came up with ideas to overcome the same.</p>
Role	Developer. Part of the global Enterprise Wireless Technology team.
Impact	This project demonstrated the advantages and disadvantages of using Low Power Wi-Fi on our devices. As a result, a global Enterprise Wireless Technology team was formed to evaluate various wireless technologies.

<b>SilverLine – Innovative Optical Credential Platform (Apr 2009 – Sep 2009)</b>	
Description	<p>I was a part of the team that invented this idea and filed a disclosure.</p> <p>The idea is to transmit credential data in the form of Light. The system in brief consisted of Lock and Credential with bidirectional communication over light. The communication from credential to Lock was on Visible light, and from Lock to credential over invisible Infrared. The system consisted of encryption and dynamic change of credential key after every successful transaction.</p>
Technology	Optical transmission, Embedded C programming, PIC microcontrollers
Responsibilities	Me and my two other colleagues proposed this idea to IR Disclosure committee which was accepted and funded to develop a prototype. We developed mechanical design, hardware design, firmware, product prototypes from scratch in house.
Role	Developed algorithm for dynamic key changing, protocol for information exchange between Lock and Credential. Complete Firmware Development.
Impact	The ideation, design and development of this project was done complete by us in house. It was exhibited in various forums of IR including India Leadership conference and Innovation workshops. The idea was also considered for patentability. This helped position IRETC Bangalore as an innovation centre.

<b>GT400 Biometric HandReader Development (May 2008 – Mar 2010)</b>	
Description	GT400 is the latest of the biometric Hand Reader products from Schlage Biometrics, Campbell, California. <a href="http://goo.gl/rl7jq">http://goo.gl/rl7jq</a>
Technology	Python, LxNETES, RDBMS, OODB, SQLAlchemy, SQLite, PyGTK
Responsibilities	<p>Helped achieve significant increase in storage performance - from 1000 User records to over 200,000 records, and faster performance by developing SQLite database support to the embedded application. The application is written in Python using PYGTK, SQLAlchemy and PYSQLITE.</p> <p>Developed Board Support Package for GT400 embedded linux platform. LxNETES (embedded linux) and cross compile tool chain for ARM processor was used to create bootloader, root file system, linux kernel and application libraries. The library package included over 24 libraries including Python, PyGTK, ZODB, SQLite, XMLRPC etc.,</p>
Role	Developer. Complete ownership of SQLite layer development. IRETC Bangalore representative in Schlage Engineering and Product management teams.
Impact	Single handedly delivered both application as well as BSP changes required. The new application helped transition the product from older OODB platform to relational/transactional database platform. A huge increase in storage (1000 records to over 200,000 records) and response time was achieved. Adding new libraries to BSP (Python 2.6, SQLite etc.,) made the product more attractive to our L4 customers and increased product sales.

**Computer Sciences Corporation India Pvt. Ltd, Noida****June 2005 – May 2008**

<b>Vantage – Midtier Migration, Deployment and Sustenance</b>	
Description	Vantage is a life insurance administration system built on Mainframes. Ported Vantage from mainframe to midtier technologies to realize cost savings.
Technology	Microfocus products, IBM Mainframes, Python, Autosys, Connect Direct etc.,
Responsibilities	Market study and selection of products to emulate mainframe behavior. Responsible for solving key migration issues such as EBCDIC vs ASCII, DB2 tuning, DSNUITLB for calling database from JCL etc., Part of the four member core team that did the first of its kind seamless transition of a Mainframe customer to Server based environment.
Role	<p>Technical guide and mentor for developers</p> <p>Process owner for sustaining and maintaining the software, release management and version control</p> <p>SME role and point of contact for critical issues</p>
Impact	I was awarded <b>Employee of the Year</b> award for my contributions in this project.



## Other accomplishments

- Helped develop a website for **Vishwalaya - a home for orphans** where children are raised using alternative methods of education. Used Google App Engine to develop it. You can visit the website at <http://vishwalaya.appspot.com/>. **We won the President's award in the category of Inspiring progress for this initiative.**
- White papers
  1. Enabling BACnet on IR Security controllers
  2. Market landscape and technologies in Video analytics
  3. Product features of a Remote fleet management system
  4. Market landscape study of North Korean Physical Access Control systems market
- Evaluation of IBM Maximo Product Platform
- Evaluation of IDEs for C/C++ development
- Participated in many Innovation Workshops
- Member of disclosure review committee
- Author of "The Pride Desk" and "Silhouette" columns of IR Monthly and Weekly newsletters.
- Master of Ceremonies during IR Annual Cultural Festivals
- Lead of IR Bangalore Cultural Committee
- Participation in Bangalore Hercules Duathlon, Bangalore Lipton Half Marathon and various 5K runs and cycling events.
- Developed a database application to aid recruitment in the company.

It had features to manage questions with options categorically, generate question paper, answer paper and OMR sheet automatically. Using OMR sheet to evaluate the answers will reduce the evaluation time to 1/10 of the normal time required.

## Personal Details

Date of Birth : 30 December, 1983  
Father's Name : G S Vishwanath Shastry  
Marital Status : Married  
Languages Known : Kannada, English, Telugu, Hindi  
Hobbies : Calligraphy, Mandolin, Music, Poetry, Dance, Reading, Running, Swimming  
Interests : Programming, Music, Marathon, Reading

I hereby declare that the above information is true.

Harish Vishwanath