



Program på SICS Open House 2011

9.00-11.15 Electrumssalen

Christer Norström, VD SICS: SICS idag och imorgon

Joakim Jardenberg, Mindpark: One machine och many windows
– en liten stund om människor och manicker

Bensträckare

Martin Körling, Ericsson Research: 50B connected devices and industrial-academic cooperation

Kristina Höök, SICS: Living in an Internet of Things world

Jakob Axelsson, SICS: Utmaningar inom Software and Systems Engineering

11.15 Utställningen öppnar på plan 6, hålls öppen till kl 15.00

12.00 Lunchsmörgås serveras i utställningen

13.00-14.00 Korta seminarier i Electrumssalen

Niklas Rudemo, Swedsoft: 10 gånger effektivare på 10 år

Markus Bylund: Smart kommunikation för hållbara städer

Martin Aronsson: Är det fel på tågtabellen?

Anders Holst: Swedish ICT Center for Systems Availability and Resource Efficiency

14.15-15.00 Korta seminarier i Electrumssalen

Jarmo Laaksolahti: Say it with a touch! Experiences from deploying a tactile device at Liljevalchs Vårsalong 2010.

Henriette Cramer: Understanding check-ins: from emergent location-sharing practices to location mash-ups.

Carlo Pompili, Telcred: Offline passersystem baserat på NFC

13.00-14.00 Korta seminarier i C1

Per Brand: The challenge of data-intensive applications

Fatemeh Rahimian: Vitis - an Internet-scale Publish/Subscribe Overlay

Henrik Abrahamsson: Effektivare TV-distribution

Åke Edlund: Cloud Computing and Startups

14.15-15.00 Korta seminarier i C1

Martin Nilsson:
Reverse engineering av lillhjärnan

Luca Mottola: Programming WSNs - from Great Duck Island to Enterprise Integration

Arne Andersson, Trade Extensions AB: Optimeringsbaserad e-handel

15.00 Mingel i SICS-baren

Morgonprogrammet

Christer Norström, SICS: SICS idag och imorgon

Joakim Jardenberg, Mindpark: One machine och many windows - en liten stund om människor och manicker

Martin Körling, Ericsson Research: 50B connected devices and industrial-academic cooperation

Kristina Höök: Living in an Internet of Things world

Finally, things are getting connected to the Internet. We now see plenty of examples where we interact directly with things through our mobiles, game consoles, via the web, or directly on the object. But what are the new challenges that this entails for research, industry and existing ICT- and telecom eco-systems?

Jakob Axelsson: Utmaningar inom Software and Systems Engineering

En av de största utmaningarna i industrin är att hantera den växande komplexiteten som uppstår när man i allt högre grad baserar sina produkter på mjukvara. I det här föredraget ger vi en översikt över vad SICS gör inom området Software and Systems Engineering för att möta dessa utmaningar och vilka satsningar som planeras framöver.

Korta föredrag i två parallella spår kl 13.00-15.00

Electrumsalen

13.00-13.15

Niklas Rudemo, Swedsoft: 10 gånger effektivare på 10 år

Värdet i den svenska industrin produceras består i allt högre grad av programvara – även för en traditionell produkt som en lastbil står det för över 30%. Och utvecklingen accelererar. För att klara utmaningen behöver svensk industri bli radikalt effektivare på att utveckla programvara. Swedsoft har tagit fram en forskningsagenda som ska göra det möjligt för svensk industri att bli tio gånger effektivare på programvaruutveckling på tio år.

Lokal C1

13.00-13.15

Per Brand: The challenge of data-intensive applications.

The last ten years has seen the growing importance of data-intensive applications, where extremely large data sets are analyzed. We have also seen a novel programming models and execution environments developed to handle this. In this talk we will describe the special challenges posed by data-intensive applications and describe briefly some of the recent systems that have been developed for them. Why did Google have to invent their own programming framework, map/reduce. What was wrong with existing ones? What is the significance of more recent developments such as Microsoft Dryad and Google Pregel, in what direction are we moving, and what might the ultimate programming framework for data-intensive applications?

Electrumsalen

13.15-13.30

Markus Bylund: Smart kommunikation för hållbara städer

SICS och Swedish ICT deltar i arbetet med att göra Stockholms nya stadsdel Norra Djurgårdsstaden hållbar. Markus Bylund berättar om ITs roll i detta pussel.

13.30-13.45

Martin Aronsson: Är det fel på tågtidtabellen?

SICS har länge forskat kring tidtabellsrelaterade frågor åt nuvarande Trafikverket. Forskningen har resulterat i optimerande prototypverktyg för att skapa tidtabeller men också, kanske ännu viktigare, en förändring i hur planeringen bör gå till. På Trafikverket har denna planeringsprincip fått namnet Successiv tilldelning och Trafikverket har initierat ett eget utvecklingsprogram för att genomföra denna princip. Genom att förändra processen så att planeringen sker kontinuerligt och mer målinriktat kan ökad flexibilitet och bättre service erbjudas till järnvägsföretag och i slutändan till resenärer och godstransportköpare.

13.45-14.00

Anders Holst: Nytt centrum för tillgänglighet och resursutnyttjande i industrin

Just nu pågår en kraftig utveckling inom avancerade IT-stöd för att ytterligare höja kvalitet och effektivitet inom industrin. Allt fler och billigare sensorer, komponenter förbundna via Internet, avancerad tillståndsovervakning och effektiva optimeringsmetoder har tillsammans med en kraftigt ökad beräkningskapacitet hos datorerna möjliggjort optimering av verksamheten på en helt ny nivå. SICS har under många år jobbat inom detta område, och har som ett led i en fokuserad satsning nyligen startat "Swedish ICT centrum för Tillgänglighet och Resursutnyttjande".

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Lokal C1

13.15-13.30

Fatemeh Rahimian: Vitis - an Internet-scale Publish/Subscribe Overlay

Vitis is a topic-based publish/subscribe system that exploits the correlation between user's subscriptions in order to scale to an unbounded number of nodes and topics. It constructs a navigable small-world network, which spans along clusters of nodes that have similar subscriptions. The properties of such an overlay make it an ideal platform for efficient data dissemination in large-scale systems.

13.30-13.45

Henrik Abrahamsson: Effektivare TV-distribution

TV-utbudet utvecklas alltmer mot TV on demand där tittarna kan välja att se programmen i efterhand utanför tablån. Men att skicka ut individuella TV-strömmar till varje tittare kräver mycket bandbredd och är en utmaning för operatörerna. Vi simulerar IPTV-distribution och undersöker hur man kan effektivisera utsändningen genom att lagra populära program i lokala servernoder ute i nätet. Vi studerar även inverkan av användarbeteende, lagringsstrategi och programutbud.

www.sics.se/projects/IPTVdistribution

13.45-14.00

Åke Edlund: Cloud Computing and Startups

Early stage companies, typically referred to as startups, usually have very small resources to play with and, at the same time, a strong demand for flexibility and scalability. To be able to develop business ideas into services quickly, and at the same time be able to adapt to the customer feedback is vital for these companies. Cloud computing brings the ability to scale both technologically and business-wise using pay-as-you-go paradigm, allowing the users to concentrate more resources and time on their ideas. The match between startups and cloud computing was identified early, making many of the startups early adopters of this paradigm shift. In this presentation we look more closely on how cloud computing accelerates the highly iterative innovation cycle for startups. A number of examples is given, we also discuss how cloud computing changes the overall landscape for startups and investors in startups.

<http://www.sics.se/seedaccelerator>

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Electrumsalen

14.15-14.30

Jarmo Laaksolahti: Say it with a touch! Experiences from deploying a tactile device at Liljevalchs Vårsalong 2010.

How much can you say with a touch? To explore this we created the Lega, a device for tactile and bodily ways of communicating experiences. Touching and moving the device in different ways creates a tactile trace that can be experienced by others through their own device. In this seminar we describe experiences from development and deployment of the Lega during a Liljevalchs vårsalong exhibition in Stockholm in 2010. The system was successfully deployed at Liljevalchs for two months where user studies were performed. Here we present some findings from the studies as well as general observations on what we did right, and what could be improved. (The talk will be in Swedish.)

www.sics.se/projects/supple

14.30-14.45

Henriette Cramer: Understanding check-ins: from emergent location-sharing practices to location mash-ups.

Millions of people are now sharing their location using 'check-in' apps like Foursquare, Gowalla, and Facebook Places. But where, when, and why, are people 'checking in'? We present a selection of SICS findings using real-time data from foursquare (1.8M check-ins every day), and user feedback on current emerging location-sharing practices, clashes between more playful or coordination-oriented uses, and our experiences in launching two location mash-ups: Spotisquare and ϕ 2.

<http://mobile-20.blogspot.com/>

14.45-15.00

Carlo Pompili, Telcred: Offline passersystem baserat på NFC

Telcreds patenterade modell för att utfärda och verifiera "virtuella nycklar" möjliggör ett offline passersystem som inte behöver uppdateras när användare eller deras rättigheter förändras och som samtidigt ger stark säkerhet. NFC är en teknik som håller på att införas i nya mobiltelefoner och som tillåter telefonen att uppträda som ett kontaktlöst smart card, med den skillnaden att den kan uppdateras via mobilnätet.

www.telcred.com

Lokal C1

14.15-14.30

Martin Nilsson: Reverse engineering av lillhjärnan

Lillhjärnan ser till att muskelrörelser fungerar snabbt och precist. Den innehåller ett avancerat kaskadkopplat regelsystem med remarkabel förmåga till stabil reglering utan förprogrammerade modeller. Detta har industriellt intresse, och i samarbete med neurofysiologer vid Lunds universitet arbetar SICS därför med att ta reda på hur lillhjärnans styrmetoder fungerar.

14.30-14.45

Luca Mottola: Programming WSNs - from Great Duck Island to Enterprise Integration

In this talk, we will briefly survey a decade of WSN programming techniques, since the inception of the field until present. In doing so, we will highlight the issues solved by now as well as those still standing. In particular, we will discuss the programming challenges involved in integrating WSNs with larger computing infrastructures. Addressing this issue, currently preventing large-scale adoption of WSNs in industry, is fundamental to effectively enable an "Internet of Things" where WSNs provide the ultimate bridge between virtual and digital worlds.

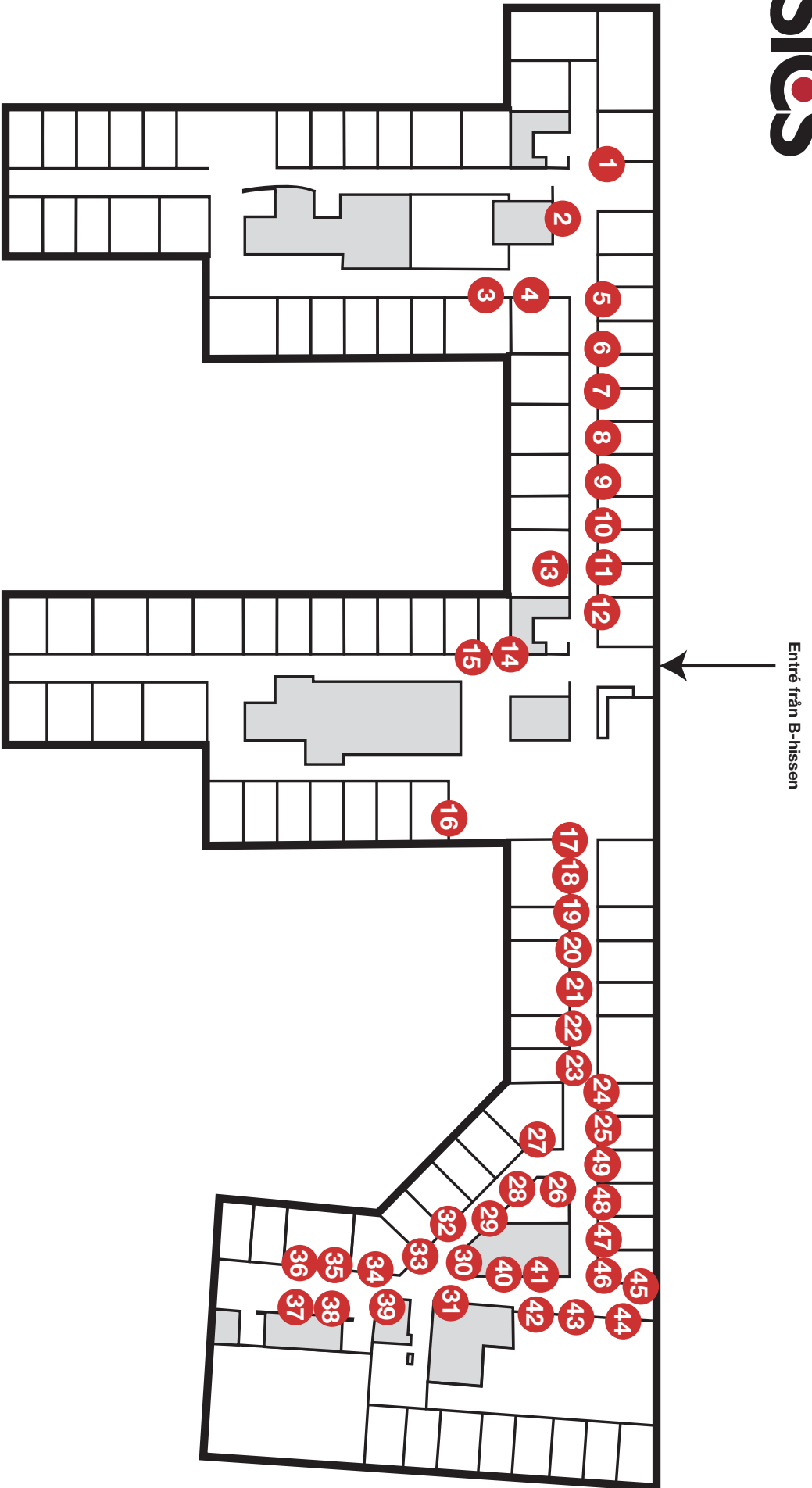
www.project-makesense.eu/

14.45-15.00

Arne Andersson, Trade Extensions AB: Optimeringsbaserad e-handel

Trade Extensions levererar en optimeringsbaserad upphandlingslösning som idag används av några av världens allra största företag. Vi presenterar några av de mest grundläggande teknikerna samt erfarenheter av att omvandla teoretisk forskning till framgångsrikt företagande.

www.tradeextensions.com/



1. Say it with a touch!

A well-known proverb suggests that you can say more than a thousand words with a picture. But how much can you say with a touch? To explore this we have created the Lega, a device for sharing touch with a focus on tactile and bodily ways of communicating experiences.

Contact: Jarmo Laaksolahti, jarmo@sics.se
www.designingsuppliesystems.blogspot.com/

2. There's inspiration to be found in technology!

When designing a new plastic bowl for the kitchen, designers consider the material characteristics of plastic and use that knowledge to make their design better. When designing new hardware and software our novel Inspirational Bits method improves design.

Contact: Petra Sundström petra@sics.se

3. Affective Health – know thy body!

The Affective Health system is a mobile service that empowers people to monitor and understand their own stress levels vis-à-vis their everyday activities. By providing users with easy to grasp visualizations of data captured from body sensors bio-feedback loops are created. When mirrored back to the user, the relationship between activities in the world and how their bodies respond to them can help users to build meaningful relationships between their experiences and how that affects their bodies.

Two studies have been conducted in real life settings. The first study investigated the usage of the system. In the second study the participants used the system for a longer period of time and during the test we conducted interviews about reflection and changes in behavior.

Contact: Kristina Höök, kia@sics.se
and Anna Ståhl, annas@sics.se
www.sics.se/ah

4. Bringing centaur experiences into design

By analyzing a horseback riding experience, we came to see the rich, sensory experiences and 'bodily ways of knowing' required to feel as one with your horse – to become a centaur. We rarely see that kind of richness in the digital world. How can we change that? What are the experiential qualities that we should transfer from riding to design?

Contact: Kristina Höök, kia@sics.se

5. The camera on your mobile phone can do more than you think

Future mobile applications can make use of the camera as a sensor to detect objects and places. We are showing new concepts

for using computer vision techniques in mobile applications to create new user experiences. We present our two new applications: With the "Subway Art Information System" mobile phone users can take a picture of any of the art pieces in the Stockholm subway stations to retrieve information about it. The application "Pic-In" can recognize places and allows users to check-in to location-sharing service foursquare by taking a photo of a place. To build up a database of reference pictures we use crowdsourcing techniques.

Contact: Sebastian Büttner, sebastian@mobilelifecentre.org and Tengjiao Cai, caitengjiao1987@gmail.com
http://mobile-20.blogspot.com/

6. Mobile location-based web mash-ups

While native mobile apps are increasingly popular, the mobile web browsers are getting increasingly powerful. With support for HTML5, mobile web apps are quickly becoming viable candidates to native apps. We show experiments with mobile web services, location based services in the browser, and how you can do mobile web services by combining existing services to form mash-ups.

Contact: Mattias Rost, rost@sics.se
www.mobile-20.blogspot.com

7. Extreme interaction: fear, fun and body @ the amusement park

For some reason people like to get scared and play with their bodily fears. They not only like it. They even do it as full day events with family and friends. What can we learn from such experiences at amusement parks for the design of bodily engaging technologies? Is it possible to design interactive mobile technologies for similar kinds of bodily, playful and social experiences?

Contact: Carolina Johansson, lina@sics.se

8. Poster: From bark to blood

The human body is a part of nature. The moss on a stone, a frozen raindrop, a leaf dancing in the wind is the material that will build our future mobile life style applications. To learn more about yourself and your body, mobile applications for health should perhaps be designed with nature as inspiration? Bio sensor technology has recently become more wearable and this opens up for new designs. The human body is a fantastic resource, but it is also unpredictable. Sensing your heart, your sweat and how you move will give you a picture of yourself that you did not know existed. This picture makes you part of a larger whole – a part of nature.

Contact: Anna Ståhl, annas@sics.se or Elsa Kosmack Vaara, elsa@sics.se

9. My secure mobile phone

Today mobile phones are almost as complex as desktop computers. As a consequence threats by malicious software are almost as present on them and other embedded systems as well.

In a demonstration and posters we show how virtualization can isolate your banking application from dubious games on your mobile and how formal methods can help you in getting assured that it is secure.

Contact: Oliver Schwarz
www.sics.se/projects/tngsecurity

10. Securing Web 2.0 on mobile phones

Social media are moving into the mobile space, taking advantage of the unique features of mobile phones. However security and privacy issues, resulting from this combination, endanger wide acceptance.

The Social Wireless Network Secure Identification (SWiN) project aims to provide solutions for these issues, in order to facilitate the transition of social networks to mobile phones.

Contact: Ludwig Seitz, Ludwig@sics.se
www.sics.se/projects/swin

11. On the consistency of WSN simulation results

The NETS lab is involved in development of the OMNeT++ simulation environment, especially modeling battery consumption and communication protocols for WSNs.

Our ApplTestTool is used to create unit and ensemble test suites. The tool also enables systematic attempts to replicate IEEE 802.15.4 performance results reported in the literature.

Contact: Laura Feeney:
www.sics.se/nets/software

12. Subversion version control over information-centric networks

Information-centric networking (ICN) is a paradigm for the network of the future where the information itself is the focus for network-level mechanisms and abstractions. This demo shows how the subversion version control system, a legacy host-based application, benefits from using the communication service of OpenNetInf and CCNx, two ICN research prototypes.

Contact: Bengt Ahlgren

13. 10 gånger effektivare på 10 år

Värdet i det svensk industri producerar består i allt högre grad av programvara – även för en traditionell produkt som en lastbil står det för över 30%. Och utvecklingen accelererar. För att klara

utmaningen behöver svensk industri bli radikalt effektivare på att utveckla programvara. Swedsoft har tagit fram en forskningssagenda som ska göra det möjligt för svensk industri att bli tio gånger effektivare på programvaruutveckling på tio år.

Kontakt: Niklas Rudemo, Swedsoft, niklas@swedsoft.se

14. IP-anything - the freedom in a name-based approach.

When communicating with remote hosts on the Internet, applications need to decide between IPv4 or IPv6. Using a name-based approach, this becomes a non-issue. Applications can be made simpler and become more robust as the OS ensures connectivity through whichever means that may be best at that given moment. We will demo name-based sockets and happy-eye balls, two standardization efforts developed by SICS within the the Internet Engineering Task Force (IETF).

Contact: Javier Ubillios, jav@sics.se
www.sics.se/NBS

15. Olle Olsson: Kör mobilt på webben

Vad kan mobiltelefonen ge webben, och vad kan webben ge mobiltelefonen? Morgondagens mobilanvändning handlar inte bara om "appar". Nu växer webbt teknologier fram, som gör att man kan bygga sina mobiltillämpningar baserade på standarder. Man kan i allt större utsträckning få tillämpningarna att utnyttja mobiltelefonens unika egenskaper. I denna posterpresentation ges en översikt över vad som är på gång i området standarder för den mobila webben.

Kontakt: Olle Olsson, olleo@sics.se
www.w3c.se

16. The Flower Wall

This interactive installation lets you take a picture with your mobile phone camera, and "plant" it as a flower on the screen. Flowers grow to cover the whole screen and create a dynamic wallpaper for your living room. The project shows how interactive and autonomous systems can be used in new types of consumer products.

17. P2P Video on Demand using the Gradient

This project will demonstrate a new peer-to-peer video-on-demand system developed at SICS. The system uses a modified version of BitTorrent for file transfer between nodes based on UDP with Ledbat congestion control. Nodes are structured using a Gradient topology according to download position, enabling smaller piece sizes and more efficient piece advertisement.

Contact: Jim Dowling

18. Säker och pålitlig journallagring

I samarbete med indiska Centre for Development of Advanced Computing (C-DAC) tar SICS ta fram ett system, kallat DIGHT, med kapacitet för att lagra alla indiska medborgares sjukvårdsjournaler. Vi demonstrerar systemets lagrings- och säkerhetsinfrastruktur genom en SMS-baserad tjänst för att skapa och uppdatera patienternas personuppgifter.

Kontakt: Jim Dowling jdowling@sics.se (även Frej)
<http://dight.sics.se>

19. Secure Cloud Computing

Cloud computing promises seamless computing for everyone, everywhere through remote computing and data storage. But when sensitive data and programs travel out into the cloud, the potential for devastating data leaks increases. While traditional virtualization and operating systems isolate programs from each other, they do not protect the data from malicious cloud administrators, who may sneak in to the system and steal sensitive data.

To address this problem, we demonstrate a cloud computing system that protects the cloud users' data from the cloud administrators, while also protecting the cloud infrastructure from malicious users.

Contact: Lars.Rasmusson@sics.se, Mudassar.Aslam@sics.se
www.sics.se/projects/TESPEVS

20. Binary code injection

Despite its many problems, binary code is the most used distribution format for programs. It is hard to analyze what a binary program will do. Furthermore, running programs are often subverted by hackers who trigger execution of unintended code. To protect data and resources from an untrusted binary program, we need a tool that lets us observe binary programs, including the OS kernel, while they are running, and lets us prevent them from doing bad things.

We are developing a tool to mix new binary code into a running system. It is operating below the OS kernel level in order to capture all binary code execution in a system. We will demonstrate the current status of the binary code translation framework.

Contact: Lars.Rasmusson@sics.se
www.sics.se/vm-based-program-modification

21. Vitis: An Internet-scale Publish/Subscribe Overlay

Vitis is a topic-based publish/subscribe system that exploits the correlation between users subscriptions in order to scale to an unbounded number of nodes and topics. It constructs a navigable small-world network, which spans along clusters of nodes that have similar subscriptions. The properties of such an overlay make it an ideal platform for efficient data dissemination in large-scale systems.

Contact: Fatemeh Rahimian, Sarunas Girdzijauskas
www.sics.se/projects/vitis

22. Navigable social networks

We introduce a decentralized algorithm that makes social networks navigable, i.e., it allows any pair of nodes to efficiently discover each other by using only local knowledge. The existing techniques are effective only for small network sizes and do not have an estimation over graph dimensionality. Our approach allows us to map large social graphs into d-dimensional spaces, without deterioration of routing performance as compared to the state-of-the-art solutions.

Contacts: Seyed Mohammadreza Seyed Khamoushi, Sarunas Girdzijauskas

23. Partitioning Graph Databases: a Social Network Perspective

Graph databases excel in storing and processing Social Network data. However, with ever increasing volume of social data, scalability of conventional methods such as full replication and disjoint partitioning of databases becomes challenging. In this work we propose to solve this problem by using of a hybrid approach consisting of replication techniques together with Distributed Diffusive Clustering to efficiently distribute the social network data on multiple machines.

Contacts: Sahar Fallahtoori, Alex Averbuch, Martin Neumann, Sarunas Girdzijauskas

24. Runtime partitioning of the Neo4j Graph Database

The amount and connectivity within stored data increases every year. Graph databases such as Neo4j efficiently store and process such connected data, but need to be partitioned for large data-sets. Partitioning leads to interdependencies between servers, increasing latency and network traffic. We introduce a framework to address this problem, performing partitioning at runtime on dynamic graphs.

Contact: Alex Averbuch, averbuch@sics.se, Martin Neumann, mneumann@sics.se
www.sics.se/project/vision

25. Event-driven programming model for data-clouds

To reduce latency & network traffic in data-intensive computation it is crucial to execute close to data. For incremental analysis of large data sets batch-job analysis is cumbersome & inefficient. VISION Cloud introduces an event-driven programming model & distributed runtime. Processes register to events on data and are executed when they occur (e.g. analysis triggered by data arrival).

Contact: Alex Averbuch, averbuch@sics.se, Martin Neumann, mneumann@sics.se
www.sics.se/project/vision

26. Information Visualization in a WSN Maintenance and Analysis Scenario.

A Wireless Sensor Network (WSN) deployed in a working industrial automation setting will generate large amounts of complex information. This is information that has to be analyzed quickly and effectively, should problems occur.

Currently, and in cooperation with ABB Corporate Research, we are working with techniques from Information Visualization on how to handle, inspect and analyze information generated in such installations.

Contact: Fredrik Holmgren (fredrikh@sics.se)
www.sics.se/projects/netvis

27. A Detailed Model of Uplink Data Processing in 3GPP Long Term Evolution (LTE) Radio Base Stations (RBS)

We developed a detailed model of RBS LTE uplink data processing using ArchiDeS - a novel flexible and efficient programming framework for multi-core architectures. The model faithfully represents the part of LTE RBS software architecture dealing with processing of user data (so-called "data plane") and accurately simulates resource consumption - CPU cycles, memory accesses and hardware accelerator utilization. We model LTE RBS processing as a fine-grained data-flow computation. The majority of individual tasks are less than 1 microsecond long. With ArchiDeS, the application architecture is separated from multi-core execution scheduler design. We evaluate the model on a Tiler's TILEpro 64-core system. The evaluation shows good scalability even with the simplest work-stealing scheduler, and revealed the importance of managing and reducing contention in shared objects such as models of RBS hardware accelerators. The evaluation shows surprisingly good scalability even with the simplest work-stealing scheduler, and revealed the importance of managing and reducing contention in shared objects such as models of RBS hardware accelerators.

Konstantin Popov (kost@sics.se)
www.sics.se/projects/archides

28. Architecture-aware Scheduling of Tasks

Processor designs are becoming increasingly heterogeneous and distributed in nature. To extract raw performance out of these processors, a programming model which can cope with the hardware diversity and scale up to several hundreds of cores is very much required. One such programming model is OmpSs. Using the OmpSs programming framework, we show that by taking architecture locality and temperature into

consideration while scheduling tasks, better performance is achieved than by those unaware of the underlying architecture.

Ananya Muddukrishna (Ananya@kth.se), Artur Podobas (artur@kth.se), Mats Brorsson (matsbror@sics.se)
www.encore-project.eu

29. How to shear a fish (or Wool on Barrelfish)

Barrelfish tries a new experimental approach to the multicore problem. Following the multi-kernel model it solves the scaling issue by strictly using message passing internally. This project is focused on creating a user-level scheduler which would allow applications to use shared memory programming models, exploiting hardware support while taking advantage of the clean message-passing OS infrastructure.

Contact: Georgios Varisteas (yorgos@kth.se), Mats Brorsson (matsbror@sics.se), Karl-Filip Faxén (kff@sics.se)
www.barrelfish.org/

30. Realistic Simulation of Radio Interference in COOJA

Radio interference drastically affects the reliability and robustness of wireless communications. As wireless sensor network protocols are frequently designed and tested in simulation environments first, we need simulation tools that provide means to study the impact of radio interference. Towards this end, we extend the COOJA simulator with the generation of realistic interference sources.

Contact: Thiemo Voigt, Fredrik Österlind
www.sics.se/nes

31. Snap - a Sensor Network Appstore

Ease of deployment was always seen as a major selling point of wireless sensor networks, yet deployment remains extremely difficult. We have developed Snap, a sensor network appstore and deployment system for Contiki and IP-based sensor networks. With Snap, sensors are positioned and configured on an Android phone. After deployment, new apps can be downloaded into the sensor network from a sensor network appstore.

Contact: Niklas Wirström, Simon Duquennoy
www.sics.se/nes
www.sics.se/~niwi/snap

32. Poster: makeSense - easy Programming of Integrated Wireless Sensor Networks

WSNs will play a critical role in the next computing revolution of the Internet of Things. However, developing WSN software is currently difficult, preventing WSNs from reaching industry adoption. The makeSense project aims at enabling an easy and ef-

fective integration of WSNs in business processes. The results of the project will be a landmark for WSN software development, as well as a new way to look at WSN programming that increases productivity and business value.

Contact: Luca Mottola
www.project-makesense.eu/

33. Structural Health Monitoring with Networked Embedded Systems

The objective of the Struct project is the development of technology and algorithms for structural monitoring using networked embedded systems. As a case study we target railway bridges, which represent a challenging environment for this type of technology. In contrast to mainstream deployments of networked embedded systems, our scenario is highly data intensive and poses stringent requirements in terms of data accuracy, reliability, and lifetime.

Contact: Luca Mottola, Thiemo Voigt
www.sics.se/nes

34. Securing Internet of Things with Lightweight IPsec

Real-world deployments of wireless sensor networks (WSNs) require secure communication. It is important that a receiver is able to verify that sensor data was generated by trusted nodes. In some cases it may also be necessary to encrypt sensor data in transit. In the Internet of Things, all communication should be IP-based. We show that IPsec communication with IPv6 is possible even for very resource constrained devices such as sensor nodes.

Contact: Shahid Raza, SICS, shahid@sics.se and Simon Duquennoy simondqu@sics.se
www.sics.se/nes

35. Detailed IEEE 802.15.4 Link Quality Analysis Using Software-Defined Radio

Investigating poor radio links is difficult without specialized equipment. For the operator of a wireless sensor network formed by low power and low cost IEEE 802.15.4-compliant radios, diagnosis of link failure usually means collecting a problematic node's received signal strength (RSS). We have come up with an alternative solution. By building a link quality monitor using a software-defined radio library (GNU Radio), we leverage signal processing techniques to calculate link metrics that provide extra insights into a radio link's quality.

Contact: Zhitao He
www.sics.se/nes

36. IPv6 Interoperability for the Internet of Things

In a joint effort between SICS, Johns Hopkins University, and UC Berkeley, we have for the first time demonstrated IPv6 interoperability between SICS's Contiki operating system and UC Berkeley's TinyOS, but also showed that the interoperability problem was more complex than previously seen. This is important as the Internet of Things requires both interoperability and low power consumption, but interoperability and low power consumption have thus far been mutually exclusive.

Contact: Adam Dunkels, Joakim Eriksson, Nicolas Tsiftes
www.sics.se/nes

37. Increasing energy efficiency - monitoring and control of Smart Homes and Grids

Europe and the rest of the world share common goals towards energy efficiency and sustainability. To achieve these goals, distribution and control of energy needs to be made more efficient. A number of projects where SICS is involved are making improvements in this area. The demo shows how power consumption by end users can be monitored and controlled using standard tools and protocols. From devices in homes, via data aggregation in the Smart Grid, to cloud level business services.

Contact: Joel Höglund, Joakim Eriksson
www.sics.se/nes

38. Increasing energy efficiency through neighbourhood oriented monitoring and control

Distributed generation of energy from multiple vendors is a challenge for power management systems that need to optimise the production and distribution of energy using local data.

The NOBEL project is providing the control network for monitoring and control of energy on a neighborhood level. The energy consumers can communicate their needs directly with producers. Efficient integration is achieved by using IPv6 technology to interconnect services, monitoring middleware and end user sensors and meters.

Contact: Joel Höglund, Joakim Eriksson
www.sics.se/projects/nobel

39. Low-power Sensor Network Communication in the Art Gallery

Nodes in wireless sensor networks duty cycle their radio to preserve energy. In such networks, broadcasting is expensive. We argue that there is a class of traffic that benefits from a different approach and present politecast as an alternative to broadcast. Politecast was evaluated in the Lega deployment at Liljevalchs for two months and was shown to prolong system lifetime and reduce congestion in the wireless medium.

Contact: Marcus Lunden
<http://designingsuppliesystems.blogspot.com/>

40. eHälsa och digital delaktighet

SICS och Santa Anna gör en samlad ansträngning tillsammans med andra delar av Swedish ICT och olika företag att utveckla nya tjänster och produkter för den snabbt växande marknaden för äldreomsorg och vård i hemmet. Under året har vi speciellt arbetat med att genomlysna behoven i anslutning till satsningen på Norra Djurgårdstaden som en föredömlig framtida stadsmiljö som också inkluderar ett hållbart åldrandeboende. I olika utvecklingsprojekt arbetar vi med att förbättra kommunikation och tillgänglighet för monitorering av sjuka i hemmet, trygghets-system, nutrition/matdistribution, informationsförsörjning för vårdaktörer, accessterminaler för äldre, etc.

Kontakt: Sture Hägglund, sture.haggglund@liu.se

41. Silver Technology - en analys av äldres behov av IKT-stöd

Inom ramen för att samarbete mellan SICS, högskolan i Halmstad och Botkyrka kommun har en bred studie av äldres behov av IKT-stöd genomförts. Äldre i eget boende, äldre på äldreboenden, personal samt chefer på olika nivåer har intervjuats. Ansatsen i arbetet har varit att belysa problem i de äldres vardag som är möjliga att adressera med hjälp av IKT, samt skapa uppslag för företag att gå vidare med nya produkter och tjänster.

Kontakt: Marie Sjölander

42. CrowdCulture: harness crowd power for hybrid funding distribution

CrowdCulture examines crowd technologies and is currently a model and an infrastructure for crowd/public hybrid funding applied to cultural project funding in the City of Stockholm. As a complement to the dominating existing expert based financing, our system presents a model where every (public) member in the system controls a near-realtime stream of micro payments.

Contact: Pär Hansson, par@sics.se
www.sics.se/projects/crowdculture

43. YOUSAT: Attracting a young people to the Nordic wilderness using social mobile media

The YOUSAT project proposes that to in order to attract a larger portion of the younger generation to the Nordic wilderness and to help the tourism industry develop new destinations, tourism-related players should become more active within the new social media spaces, user-generated content, in combination with new mobile location-based services.

<http://www.sics.se/projects/yousat>

44. Hållbara hybridmiljöer

Projektet "Hållbara hybridmiljöer" (Hybrid Spaces) har som mål att exploatera koncept och idéer rörande interaktiva touch- och presentationsytor av varierande storlek och utföranden. Innehållsligt är fokus mot presentation av information med inriktning mot energi och hållbarhetsförståelse. Denna information erhålles via "sökningar av sökningar" av olika sociala medier existerande på Internet (Google, Twitter etc.)

Kontakt: Anders Wallberg
www.sics.se/projects/hybridspaces

45. Addressing range anxiety for electric vehicles

Range anxiety is an issue for electric vehicle drivers. The key issue is that planning needs to be done in advance of the trip. Furthermore, range anxiety can be addressed with better technology understanding, which in turn can be achieved with a better user interface.

Contact: Lennart Fahlén
www.sics.se/projects/rangeanxiety

46. ME3Gas: Energieffektiva Smarta Hem

Målet med ME3Gas-projektet är att ge konsumenter kontrollen över sina apparaters energiförbrukning i hemmet för att möjliggöra energisparande utan att kompromissa med komfort och bekvämlighet. I projektet utvecklas en middleware-plattform som ska stödja utvecklingen av energimedvetna applikationer. Detta görs bland annat genom att erbjuda högnivågränssnitt i form av webbtjänster för alla anslutna enheter samt verktyg för att stödja utvecklingen av energieffektiva applikationer. I den här demon kommer vi att visa hur applikationer baserad på ME3Gas-plattformen kan användas för intelligent ljus- och temperaturkontroll, genom att utnyttja olika sensorer, däribland IPv6-baserade trådlösa noder som kör operativsystemet Contiki.

Kontakt: Tomas Olsson, Olov Ståhl och Joakim Eriksson
www.sics.se/projects/me3gas

47. Informed caching and predictive demand estimation in IPTV

Caching popular content in IPTV distribution can reduce bandwidth requirements for time-shift TV services significantly. Informed caching replacement policies and predistribution can reduce total and peak bandwidth utilisation even further. Reliable predictive demand estimates is then an important factor to maintain high cache hit rates which should have huge potential for media distribution generally.

Contact: Per Kreuger

48. Statistical Anomaly Detection and Visualization for Maritime Domain Awareness

Together with The Swedish Coast Guard and SAAB, SICS will in a new project provide maritime surveillance with significantly increased capabilities to detect vessels with strange and suspicious behavior, by developing methods for statistical anomaly detection and interactive visualization.

Contact: Anders Holst
www.sics.se/projects/sadv

49. A Tool for Crisis Management Planners

Emergency management is moving towards capability-based and net-centric operations. An effect is that resources required for engaging a crisis often are shared among agencies or contracted from third-party owners. As Swedish agencies plan independently for contingencies, joint efforts from several agencies in response to a crisis or an emergency may give rise to unforeseen resource conflicts. The demo shows a prototype tool that can help crisis management planners to detect such potential resource need clashes in advance. Based on such information, the planners should be able to improve existing contingency plans, for example, by improving placement and allocation sizes of existing resources, or by entering back-up resource activation contracts.

Contact: Björn Bjurling
www.sics.se/projects/resourceactivation