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# CERN

# Where the Infinitely Large Meets the infinitely small

#### Jan Janke

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Computing Engineer and Deputy Leader of CERN's Administrative Information Systems Group





# CERN



# Like a Small Town



# A Unique Place





# A Unique Place







# **Worldwide Collaboration**



![](_page_7_Picture_2.jpeg)

# The Web in 1990

![](_page_8_Figure_1.jpeg)

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# The Web in 1990

Frequently Asked Questions on WWW

```
FREQUENTLY ASKED QUESTIONS ON W3
```

An FAQ list is really a cop-out from managed information. You should be able to find everything you want to know by browsing from the WWW project page, as everything should be arranged in a logical way. Here though are things which maybe didn't fit into the structure, with pointers to the answers which maybe did. Its an experiment, started May 92. The questioners are anonymous.

I am just starting: how do I find out more?[1]

How does www keep track of the available servers?[2]

How does W3 compare with WAIS and Gopher[3] ?

How do I create my own server[4] ?

1-10, Up, <RETURN> for more, Quit, or Help:

![](_page_9_Picture_9.jpeg)

# The Web in 1990

![](_page_10_Picture_1.jpeg)

![](_page_10_Picture_2.jpeg)

# **CERN Innovates**

![](_page_11_Picture_1.jpeg)

![](_page_11_Picture_2.jpeg)

# **CERN Innovates**

![](_page_12_Picture_1.jpeg)

![](_page_12_Picture_2.jpeg)

# Research

![](_page_13_Picture_1.jpeg)

![](_page_13_Picture_2.jpeg)

# Research

![](_page_14_Picture_1.jpeg)

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# Some 'History'

Johannes Kepler (1571-1630)

• Isaac Newton (1642-1727)

![](_page_15_Picture_3.jpeg)

# Some 'History'

- Albert Michelson and Edward Morley
  - Special Relativity

J. J. Thomson discovers the electron
Discovery of the atomic nucleus

Max Planck's Law of Blackbody Radiation
 → Quantum Physics

# **Next Scientific Challenge:**

![](_page_17_Figure_1.jpeg)

# **Particle Accelerator?**

![](_page_18_Picture_1.jpeg)

![](_page_19_Picture_0.jpeg)

![](_page_20_Picture_0.jpeg)

![](_page_21_Picture_0.jpeg)

![](_page_22_Picture_0.jpeg)

### Incredible levels of energy

![](_page_23_Picture_1.jpeg)

# Incredible levels of energy

# 7 TeV

![](_page_24_Picture_2.jpeg)

#### 0'000'000'000'000

![](_page_24_Picture_4.jpeg)

![](_page_24_Picture_5.jpeg)

# **Accelerator Chain**

![](_page_25_Picture_1.jpeg)

# World-class technology...

# The Coldest Temperatures

![](_page_26_Picture_2.jpeg)

# The LHC

SUISSE

FRANCE

-CMS

ALICE

ATLAS-

SPS\_7 km

**CERN** Prévessin

CFRN-Meyrin

# **Particle Beams**

![](_page_28_Figure_1.jpeg)

# **Particle Detectors**

![](_page_29_Picture_1.jpeg)

# **Computer Centre (Tier 0)**

Raw recording rate ~10 ½ GByte/sec 175,000 processing cores 150 PetaBytes of data storage on disk

380 PetaBytes of data storage on tape ~50 PetaBytes/year

![](_page_30_Picture_3.jpeg)

# LHC Computing GRID

![](_page_31_Picture_1.jpeg)

## **Accelerator Control**

![](_page_32_Picture_1.jpeg)

![](_page_32_Picture_2.jpeg)

# The Web: Windows 95

![](_page_33_Picture_1.jpeg)

![](_page_33_Picture_2.jpeg)

# The Web: Windows 95

![](_page_34_Picture_1.jpeg)

![](_page_34_Picture_2.jpeg)

# The Web: Windows 95

THO LON	/iew <u>G</u> o <u>B</u> ool	kmarks <u>O</u> ptions <u>D</u> irec	tory <u>W</u> indow <u>H</u> elp			
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Docati	n: [http://www.m	nath.clemson.edu/~warn	er/JavaClass/Java/T	umblingDuke/example1	.html	
What's N	ew? What's	Cool? Destinations	Net Search	People Software		
Ine sour						

![](_page_35_Picture_2.jpeg)

# Java begins...

![](_page_36_Picture_1.jpeg)

![](_page_36_Picture_2.jpeg)

## IDE's....

![](_page_37_Picture_1.jpeg)

![](_page_37_Picture_2.jpeg)

# Administration

Business Processes

Electronic Document Handling

Decision Support
 CERN Expenditure Tracking
 Human Resources Toolkit

Project Management Tools
 Project Progress Tracking

![](_page_38_Picture_5.jpeg)

![](_page_38_Picture_6.jpeg)

# **Accelerator Controls**

![](_page_39_Figure_1.jpeg)

![](_page_39_Picture_2.jpeg)

# **Accelerator Controls**

![](_page_40_Figure_1.jpeg)

![](_page_40_Picture_2.jpeg)

# **Accelerator Controls**

![](_page_41_Figure_1.jpeg)

![](_page_41_Picture_2.jpeg)

# Java Today: Monitoring

![](_page_42_Figure_1.jpeg)

CERN

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# **3D** Visualization

![](_page_43_Picture_1.jpeg)

![](_page_43_Picture_2.jpeg)

# **GRID** Monitoring

![](_page_44_Figure_1.jpeg)

![](_page_44_Picture_2.jpeg)

# Java Today: Outreach

- 150'000 visitors from >90 countries
- More than 4'500 visiting groups per year

CERN Accelerating science										
Public Outreach						Ag	enda 📗 Open visi	t 👻 Group visi	it 👻 Messaging 👻	Guides 🕶 Reports 🕶 A
Day Week	All My agenda	Editor for Group Visit <u>#1583560</u>							×	٩
< 24/Feb/2017 > Today	Show notes	Print visit	Clone	e visit				(	Cancel Group Visit	
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![](_page_45_Picture_4.jpeg)

# There's more...

![](_page_46_Picture_1.jpeg)

![](_page_46_Picture_2.jpeg)

# **CERN: A Unique Place**

![](_page_47_Picture_1.jpeg)

![](_page_47_Picture_2.jpeg)

![](_page_47_Picture_3.jpeg)

![](_page_47_Picture_4.jpeg)

# **CERN: A Place of Contrasts**

![](_page_48_Picture_1.jpeg)

# **CERN: Computing Heart**

![](_page_49_Picture_1.jpeg)

# **CERN: An Open Lab**

![](_page_50_Picture_1.jpeg)

# **CERN: An Open Lab**

## **VOXEDDAYS** CERN May 1<sup>st</sup> 2019

![](_page_51_Picture_2.jpeg)

September 14<sup>th</sup>-15<sup>th</sup> 2019

# Join us in 2019!

![](_page_51_Picture_5.jpeg)

# CERN

Where the Infinitely Large Meets the infinitely small

# Thank You

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![](_page_52_Picture_3.jpeg)

![](_page_53_Picture_0.jpeg)

@GOTO

# Remember to rate this session

Thank you!

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