



# Safe Exam Browser News and Future Roadmap

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Inspira Høstseminar in Oslo/Norway, September 24, 2015

# Introduction



# What is Safe Exam Browser (SEB)

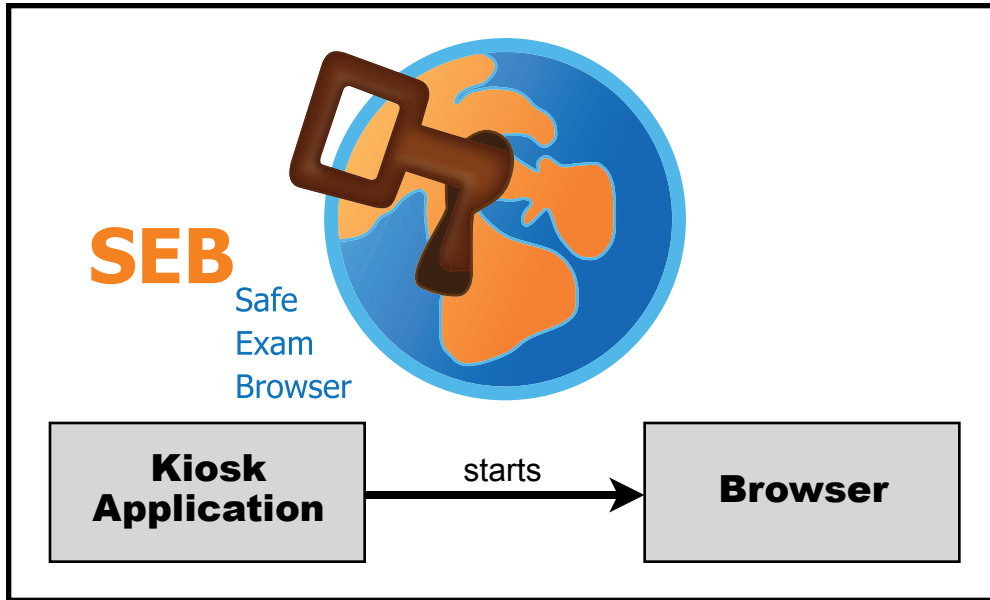
# What is Safe Exam Browser (SEB)

- Secured web browser application
- For conducting exams on computers (Windows/Mac OS X) using web-based
  - exam systems
  - quiz modules of learning management systems
- Exams using third party applications

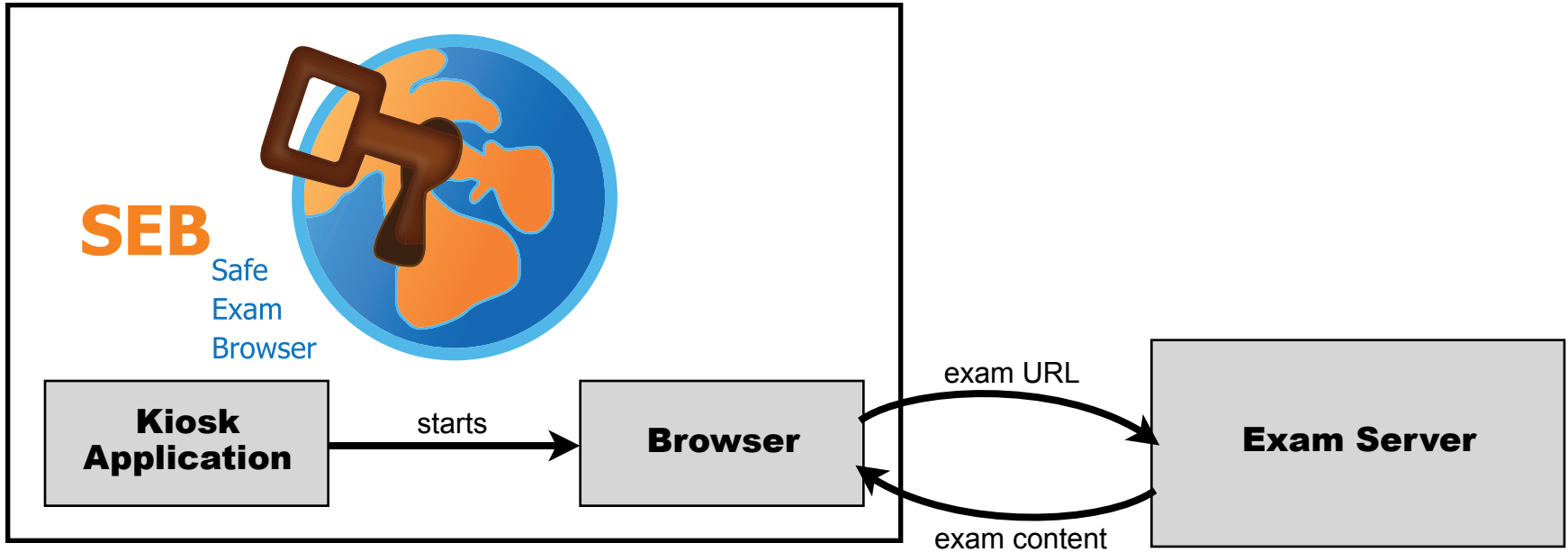
# SEB: A Modular Tool for Secure E-Assessments



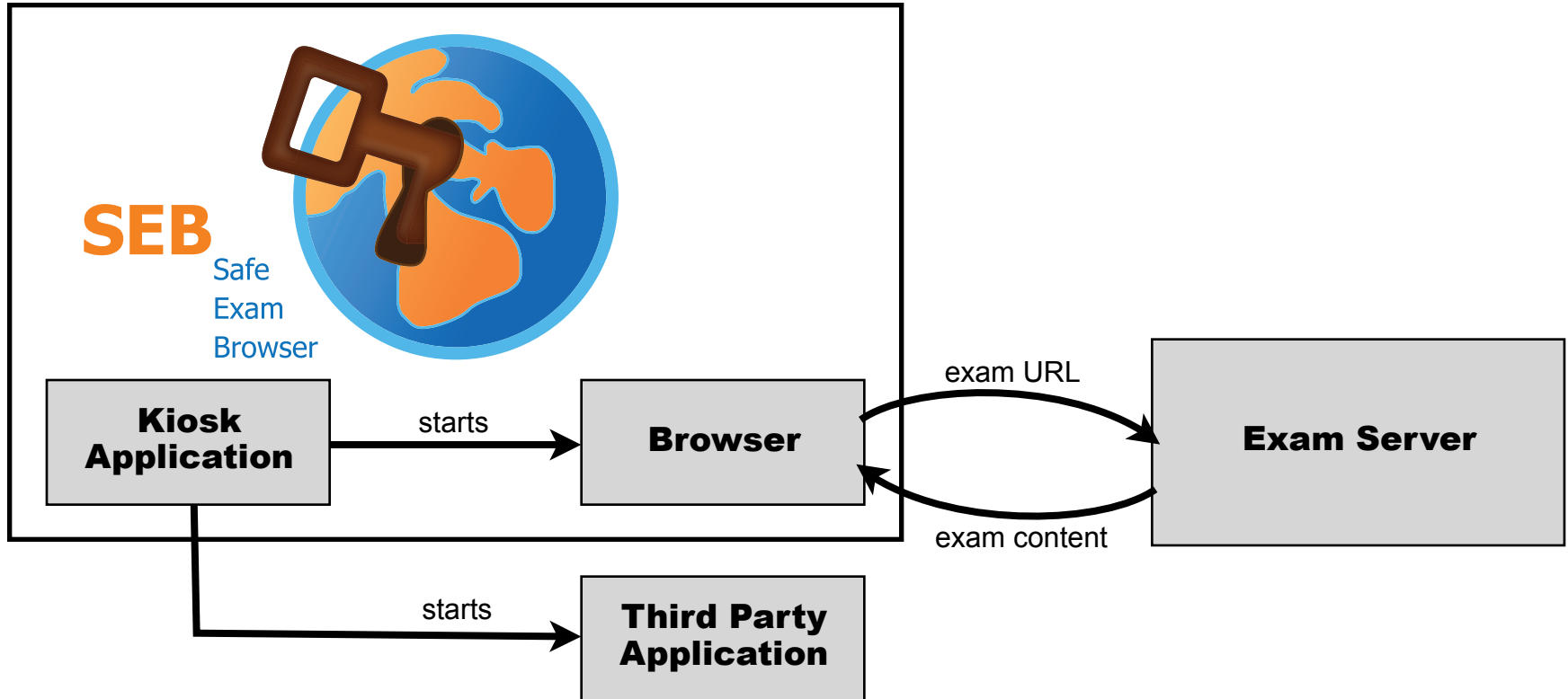
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- **Modular:** Third party applications, VDI, SEB Server
- **Free:** Open source, freeware, no centralized cloud service

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- Global user base

# Safe Exam Browser – Future of the Project

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The options we examined in the last 7 months:

1. SEB Consortium
- ~~2. Spin-off company~~
3. Something small and inside ETH

In all cases SEB shall remain open source/freeware

# SEB Consortium - Vision

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## SEB Consortium - Vision

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- SEB shall be recognized for its quality of software, its security and data privacy as well as its engagement with the user, standards and development communities.
- The SEB Consortium is established to provide a structure whereby the Community can support the direction and development of the SEB project through financial and other contributions

# SEB Consortium - Tasks

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- Foster the development of a flexible lockdown browser for educational and commercial use
- Provide financial and infrastructural support for at least two SEB-developers to allow ongoing development of SEB within the consortium
- Sustain and develop the existing community of interest for the SEB project
- Support the use and adoption of SEB software

# SEB Consortium – Benefits & Membership Fees

Category	Membership Fee	Who should join?	Benefits
<b>Principal Members</b>	€ 50,000 US\$ 60,000	Educational Institutions, Companies	Prioritize SEB development goals, get direct, personal development support and consultancy by the SEB developers. Logo of institution/company is placed on consortium website
<b>Gold Members</b>	€ 10,000 US\$ 12,000	Educational Institutions, Companies	Suggest SEB development goals, build a feature list for SEB, Get direct, personal development support and consultancy by the SEB developers. Logo of institution/company is placed on consortium website
<b>Silver Members</b>	€ 5,000 US\$ 6,000	Educational Institutions, Small Companies, public authorities	Suggest SEB development goals, logo of institution/company is placed on consortium website
<b>Bronze Members</b>	€ 2,500 US\$ 3,000	Small Educational Institutions, Small Companies	Logo of institution or company is placed on consortium website

# What's New in Safe Exam Browser



# What's New: SEB 2.1 for Windows and Mac OS X

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- Individual proxy settings, URL filters and server certificates can be used per exam
- New settings for page and text zoom, disable spell check, browser user agent
- Re-engineered SEB Config Tool now allows comfortable editing and testing of SEB configuration files

# Live Demo

# Using Virtual Desktop Infrastructure with SEB



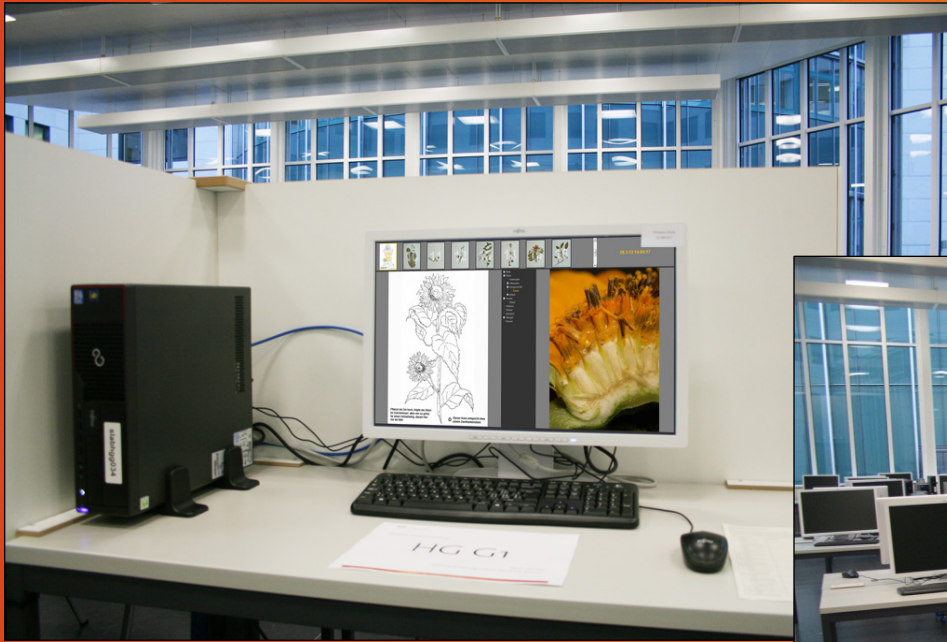
## Online Exams at ETH Zurich Swiss Federal Institute of Technology

- 2007 first pilots, 2010 regular service
- >50 exams with ~5'000 students in spring semester 2015
- Large percentage of selective, high-stakes examinations
- Summative exams designed by lecturers
- Important role of first year university exams in Switzerland





# Competency oriented exams using third party applications



# Exam tasks today



learning



exam



application  
/ competence

# Example: Programming

```

13 - M = 10^5; % Number of Monte Carlo sample
14
15 - g1 = @(x) (x+0.25).^3; % integrand 1
16 - exact_g1 = (1.25^4-0.75^4)/4; % exact va
17
18 % Applying MC and antithetic MC
19 - [Smean1, Svar1] = MC(g1,2*M);
20 - [antiSmean1, antiSvar1] = MCantithetic(g
21
22 % parameter for 0.95-confidence interval
23 - beta = norminv(0.975, 0, 1);
24
25 % Output:
26 - fprintf('\nQuestion 5:\n\n')
27 - fprintf('Exact value = %.5f\n\n', exact_
28 - fprintf('standard Monte Carlo with M = %
29 - fprintf('Sample mean is: %.5f\n', Smean1)
30 - fprintf('Asympt. valid 0.95-confidence in
31 - Smean1 - beta*sqrt(Svar1/2/M), Smean1
  fprintf('length of asympt. valid 0.95-con
    2*beta*sqrt(Svar1/2/M))
  fprintf('antithetic Monte Carlo with M =
  fprintf('Sample mean is: %.5f\n', antiSmea
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    antiSmean1-beta*sqrt(antiSvar1/M), an
  fprintf('length of asympt. valid 0.95-con
    2*beta*sqrt(antiSvar1/M))
  end
end

function [Smean, Svar] = MC(g, M)
% This function computes a Monte Carlo app
% \int_{-1}^{1} g(x) dx with M samples.
% Input: g = function handle for the in
% M = number of Monte Carlo samp
% Output: Smean = sample mean
% Svar = sample variance

```

learning

function zahlenla  
 % Dies ist ein Za  
 % Ziel ist es ein  
 % in möglichst wa  
 zahl = randi(10)  
 test = -1;  
 while (test <= zahl)  
 test = input('Ra  
 versuche = versuche +  
 if (test <= zahl)  
 disp('Zu k  
 elseif (test > zahl  
 disp('Zu g  
 end

exam

```

16 - exact_g1 = (1.2
17
18 % Applying MC a
19 - [Smean1, Svar1]
20 - [antiSmean1, an
21
22 % parameter for
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24
25 % Output:
26 - fprintf('\nQues
27 - fprintf('Exact
28 - fprintf('standa
29 - fprintf('Sample
30 - fprintf('Asympt
31 - Smean1 - bet
  fprintf('length
    2*beta*sqrt
  fprintf('antith
  fprintf('Sample
  fprintf('Asympt
  antiSmean1-b
  fprintf('length
    2*beta*sqrt
  end
end

function [Smean,
% This function
% \int_{-1}^{1}
% Input: g =
% M =
% Output: Smean
% Svar

% initializing t
Smean = 0;
Svar = 0;
end
stemplot.m ExamQ2

```

target competence

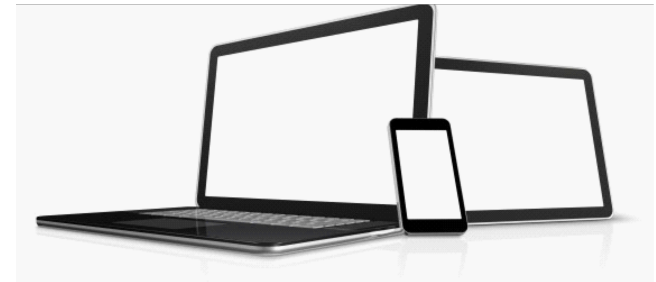
# The goal: authentic, competence oriented exam tasks



learning

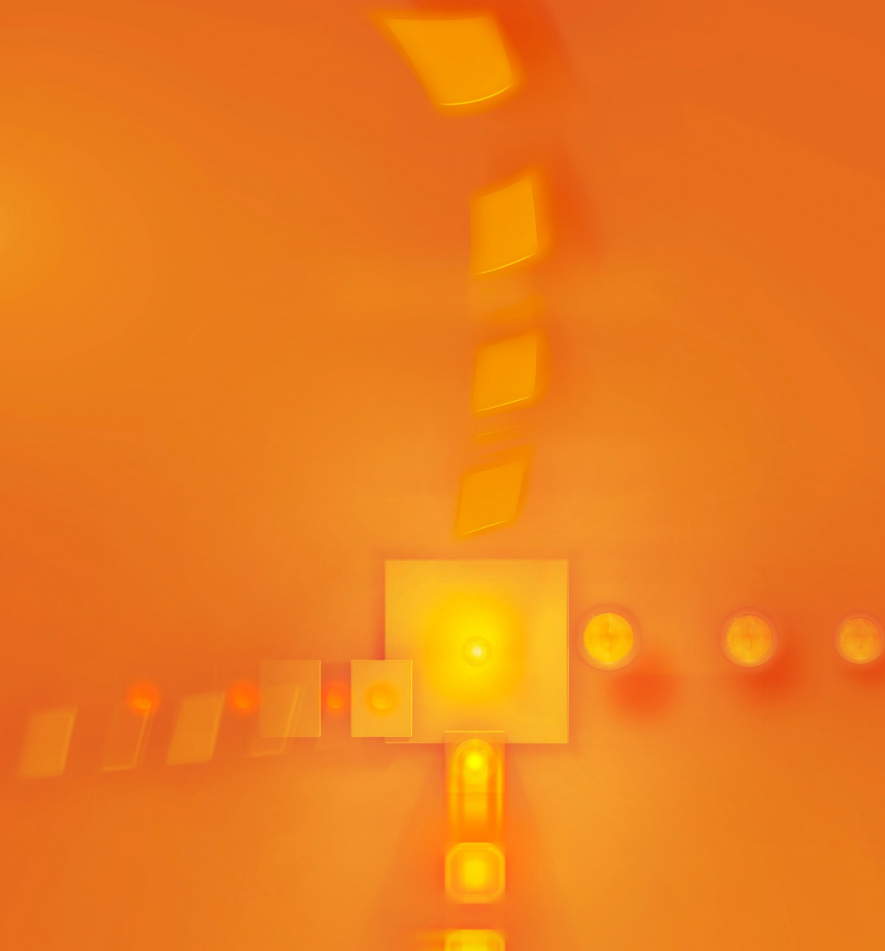


exam



application  
/ competence

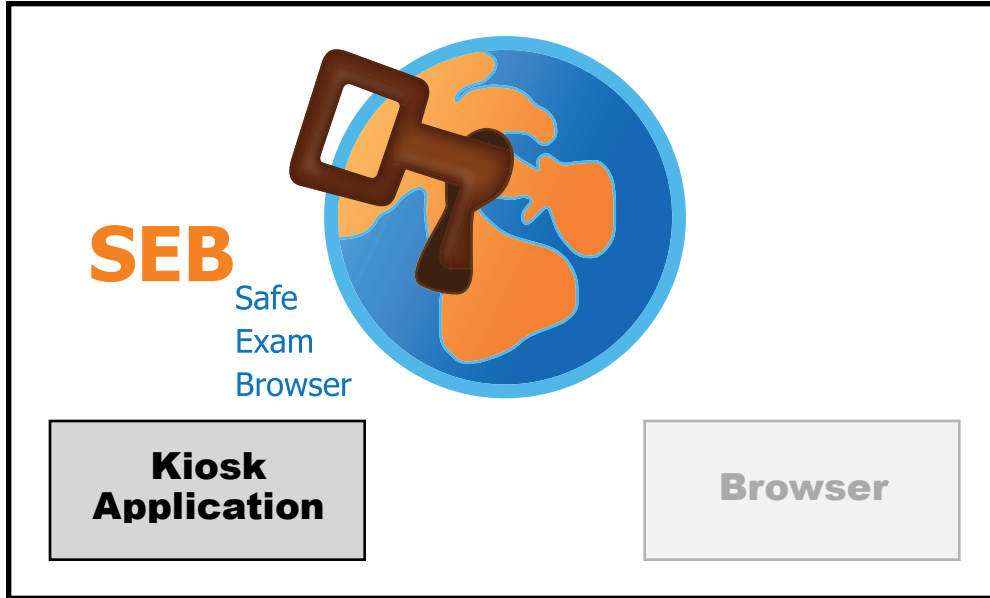
# How does it work?



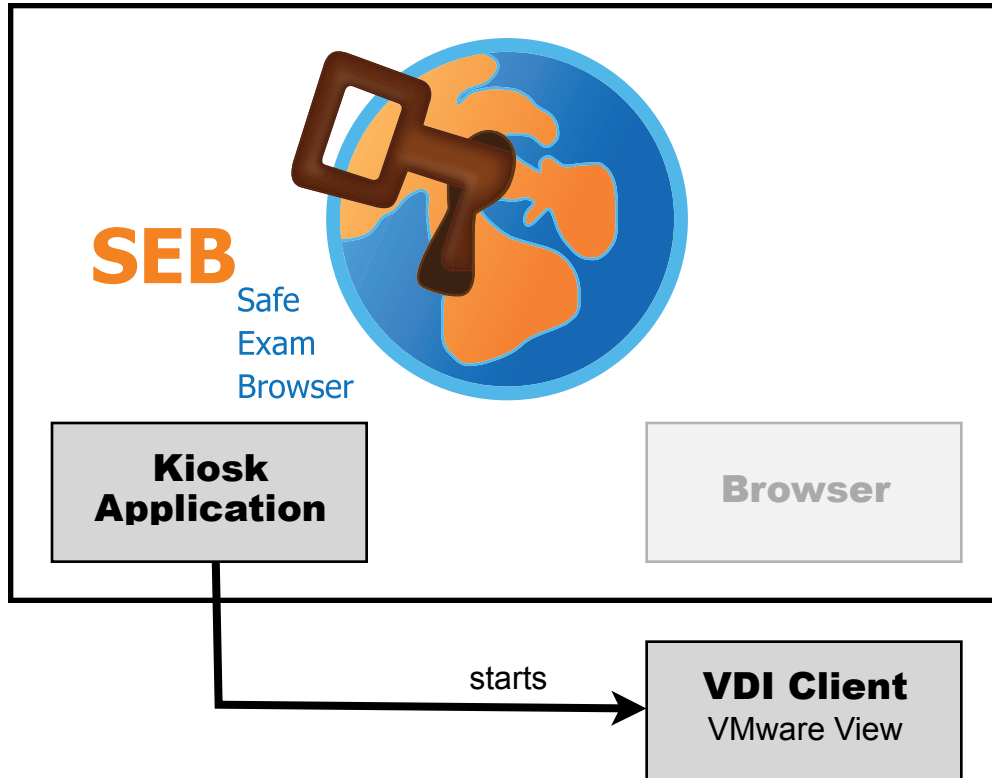
# Technology: Requirements

- Secure, fraud-proof
- Reliable, robust
- Easy to use, familiar (for students)
- Easy to customize and manage (for administrators & examiners)

# SEB with VDI



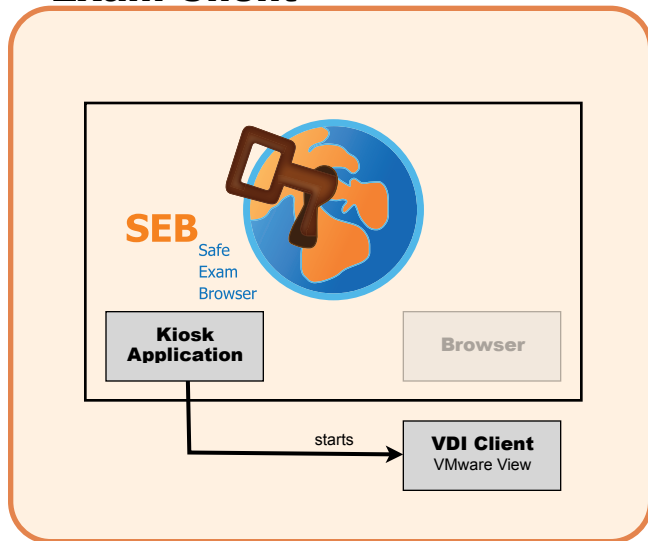
# SEB with VDI





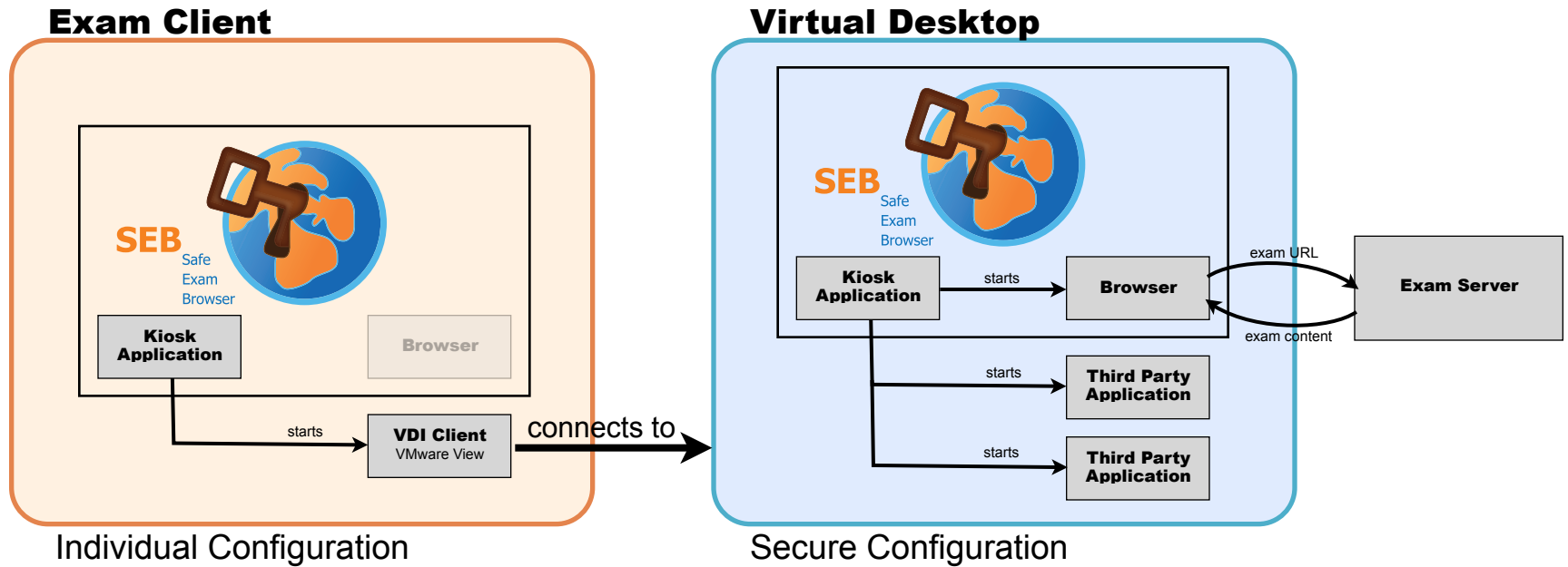
# SEB with VDI

## Exam Client



Individual Configuration

# SEB with VDI



# Future Roadmap

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- SEB 2.2
- SEB for iPad
- New browser engine in SEB for Windows
- SEB Server

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- Improved URL filter also in SEB for Windows
- New settings for language dictionaries (spell check)

# SEB for iPad

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- Works on managed iOS devices and with BYOD

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- Supporting most setting options of the SEB desktop versions



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- Clients receive exam settings automatically from the SEB Server.
- Improved security with automatic three-way authentication between SEB clients, exam system and SEB Server which drastically eases configuration.
- Easy to operate remote supervising/proctoring functionality such as screen recording and logging of user activity without requiring third party software solutions.

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Keeping the SEB exam solution modular and compatible with a wide range of exam systems

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- Installation on common open source servers
- Scalable: A centralized SEB Server for a large number of institutions will be possible

## Links

- [www.let.ethz.ch/pruefungen/onlinepruefungen/index\\_EN](http://www.let.ethz.ch/pruefungen/onlinepruefungen/index_EN)
- [www.safeexambrowser.org](http://www.safeexambrowser.org)

**Thank you for your attention.  
Please discuss...**

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