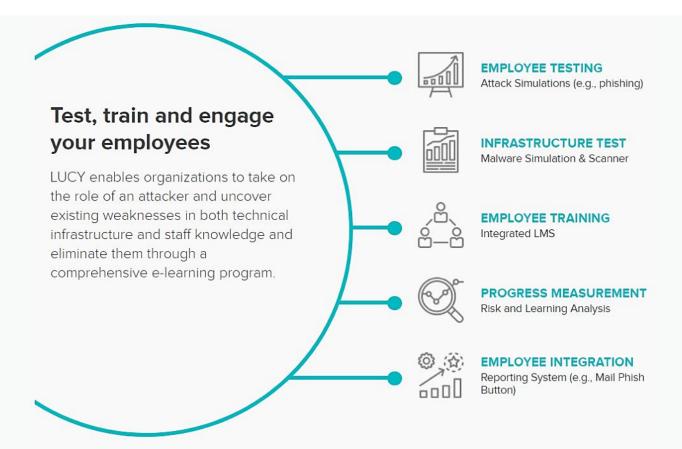


# **LUCY WHITEPAPER**



## WHAT IS LUCY?

















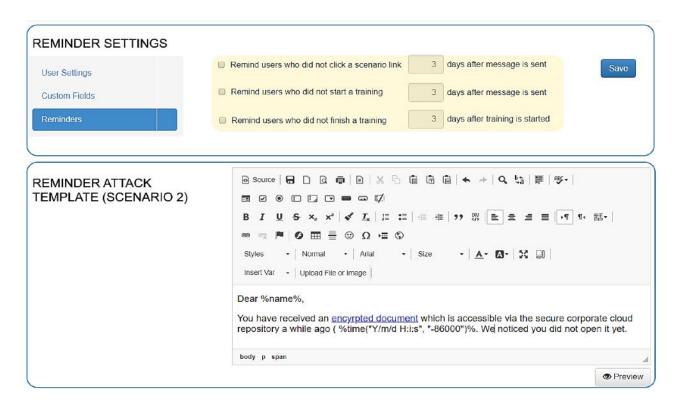




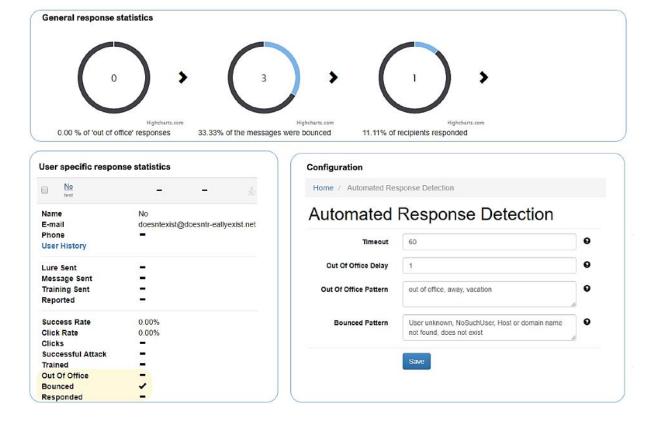


### **GENERAL FEATURES**

• **REMINDERS:** Reminder templates can be used to automatically resend messages to users who have not clicked on an attack link or a training course after a custom period of time.

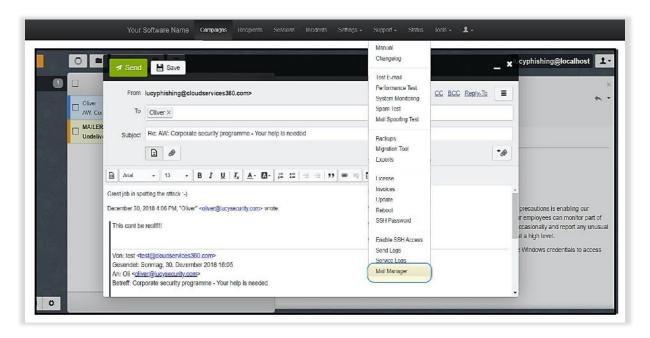


• **RESPONSE DEDECTION:** The automatic response detection makes it possible to define and analyse automatic e-mail responses (e.g., out of office) as well as mail delivery errors (e.g., user unknown) within the campaign.

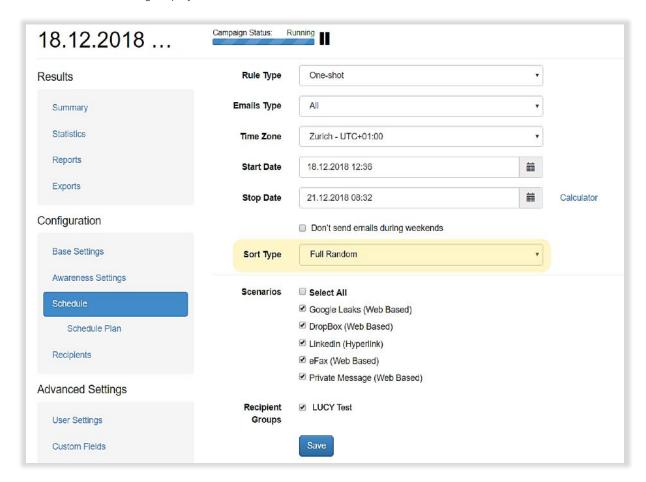




FULL MAIL COMMUNICATION CLIENT: A built-in messaging platform allows the LUCY admin to
communicate interactively with the recipients inside or outside the LUCY campaigns. All e-mails are archived
and can be evaluated.

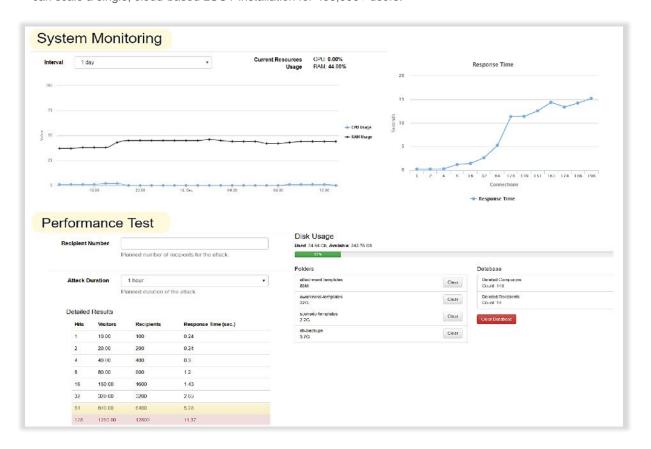


 Scheduler Randomization: Raising employee awareness at random is the key factor for effective and sustainable awareness within the organization. Randomly sending many concurrent campaigns is one of the best means of training employees.

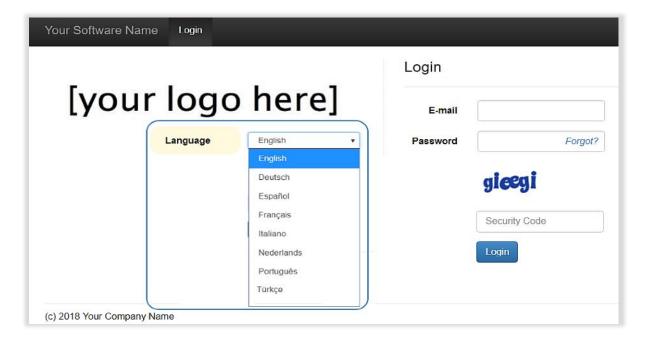




 Performance tools: LUCY smart routines adapt the server installation to the given resources. Applications Server, DBMS Sizing, Memory and CPU usages are calculated during installation or during operations. You can scale a single, cloud-based LUCY installation for 400,000+ users.

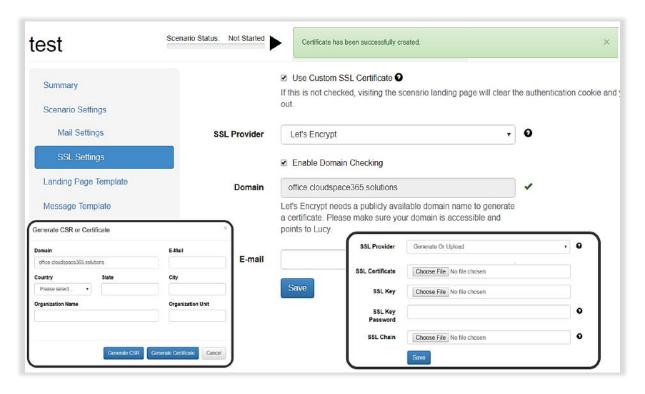


• Multilingual admin interface: The LUCY admin interface is available in different languages and can be translated into other languages on request.

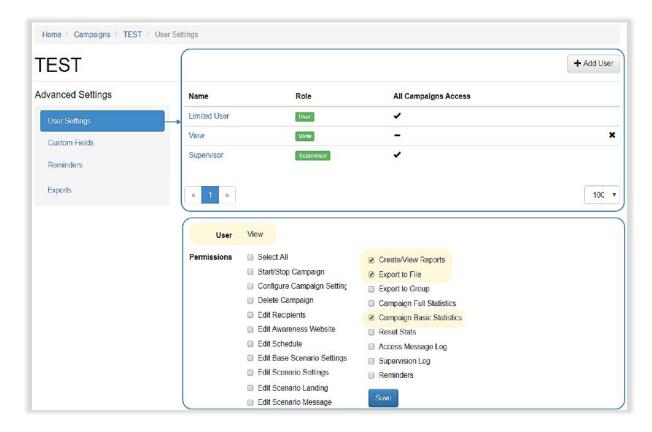




Certificate (SSL): Allows the automatic creation of official and trusted certificates for the admin, backend as
well as for the campaigns. LUCY will automatically use the domain configured in the system to generate the
certificate. If you decide to use SSL for the campaign, you can generate a custom certificate or a CSR
(Certificate Signing Request). You can also import official trusted certificates.

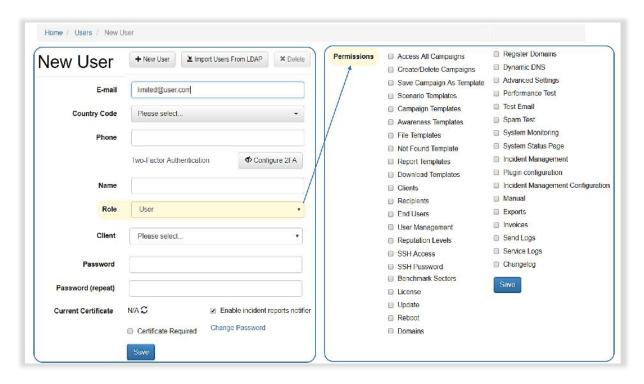


Role-based access controls: LUCY offers a role-based access control (RBAC) that restricts system access
to authorized users only. The permissions to perform certain operations are assigned to specific roles within
the user settings. Members or staff (or other system users) are assigned particular roles through which to
acquire the necessary computer permissions to perform particular LUCY functions.

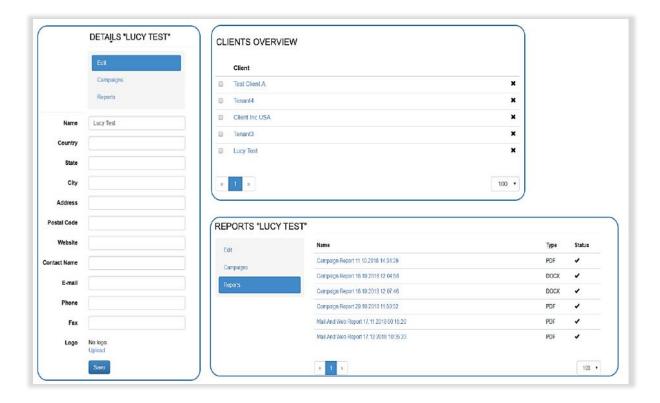




Multi-layered user groups: Quickly upload users in bulk via a CSV, LDAP, or text file. Create different
groups, organized by department, division, title, etc. Update users in a running campaign. Build dynamic user
groups based on the phishing campaign results.

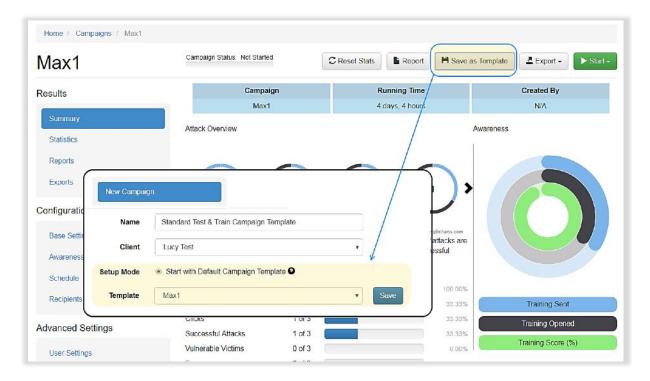


Multi-client compatible: "Clients" can refer to different companies, departments, or groups that have an
associated campaign in LUCY. These clients can be used, for example, to allow campaign-specific access or
to create customer-specific analysis.

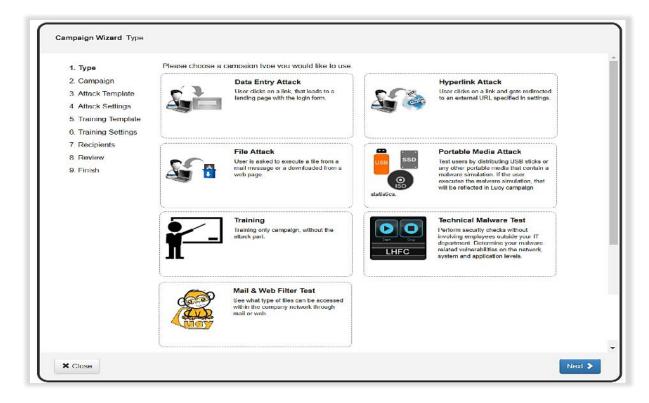




 Campaign templates: In case you want to reuse similar campaigns, you can save a complete campaign with attack templates and eLearning content as a campaign template. This feature allows you to evade having to repeat similar configurations over and over again.

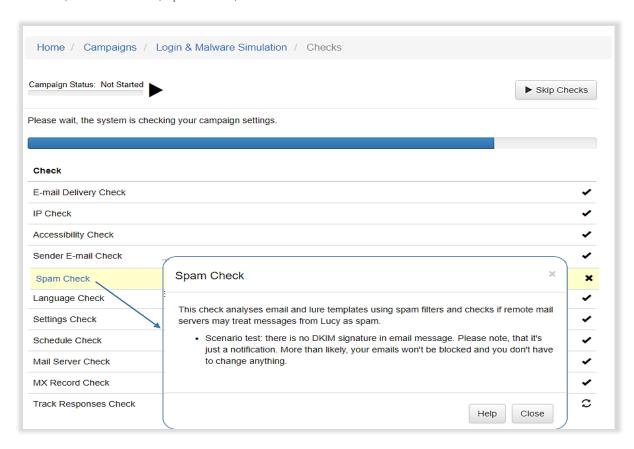


• Setup wizard with risk-based guidance: LUCY offers several Setup Tools. Create a complete campaign in less than 3 minutes using the predefined campaign templates or let the Setup Wizard guide you through the configuration. Optionally, a risk-based setup mode is available, which makes specific suggestions for the selection of attack and awareness templates based on the company's size and industry.

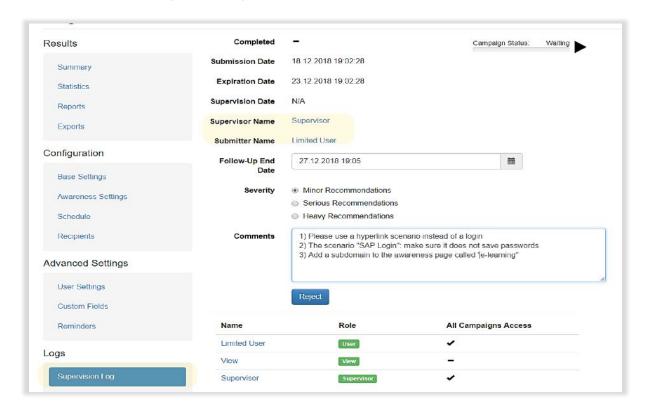




 Campaign checks: Preliminary checks before starting a LUCY campaign: E-Mail Delivery Check, MX Record Check, Schedule Check, Spam Check, and others.

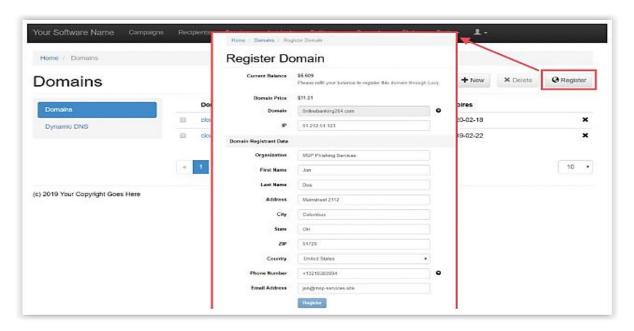


Approval workflows: A given campaign can be submitted to a supervisor in LUCY for approval.



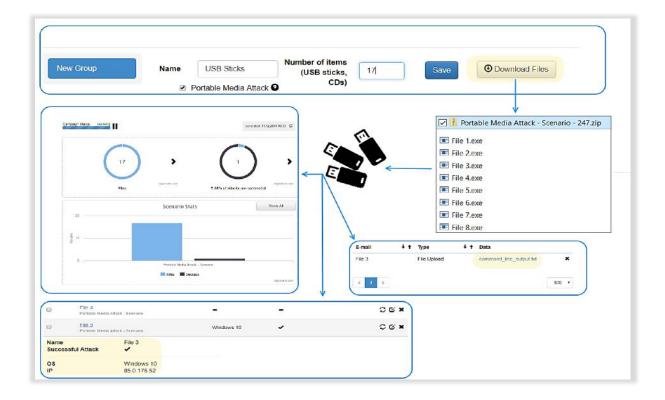


• DNS API: The DNS API allows the administrator to create any domain on LUCY within seconds. Since attackers very often use similar spellings of a customer's domain (called Typosquatting), this risk can also be represented in LUCY. If the customer's original domain is, for example, "onlinebanking.com", the DNS wizard could be used to reserve domains such as "Onlinebanking.com", "onl1nebanking.com" or "onlinebanking.services" and assign it to a campaign later. LUCY then automatically creates the corresponding DNS entries (MX, SPF, Whois Protection etc) for the IP where LUCY is installed. Of course, the admin can also use his provider's own domains in LUCY.



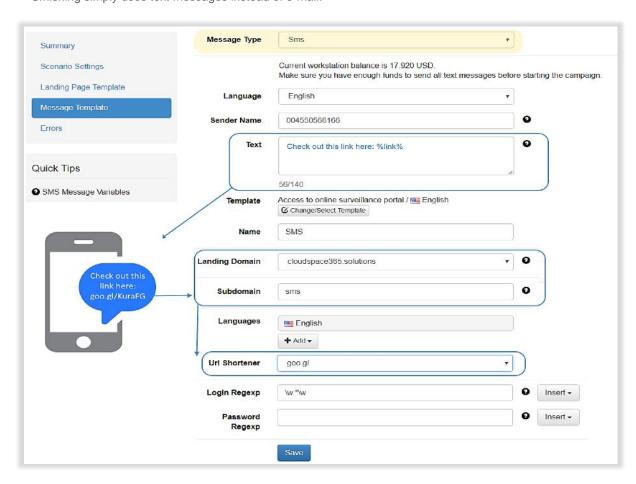
#### ATTACK SIMULATION

 Portable media attacks: Hackers can use portable media drives to gain access to sensitive information stored on a computer or network. LUCY offers the option to perform portable media attacks where a file template (e.g., executable, archive, office document with macros, etc.) can be stored on a portable media device such as USB, SD card, or CD. The activation (execution) of these individual files can be tracked in LUCY.

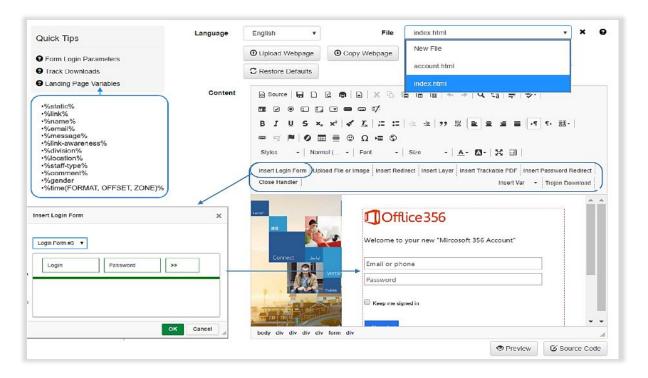




• **SMiShing:** Smishing is, in a sense, "SMS phishing." When cybercriminals "phish," they send fraudulent emails that seek to trick the recipient into opening a malware-laden attachment or clicking on a malicious link. Smishing simply uses text messages instead of e-mail.

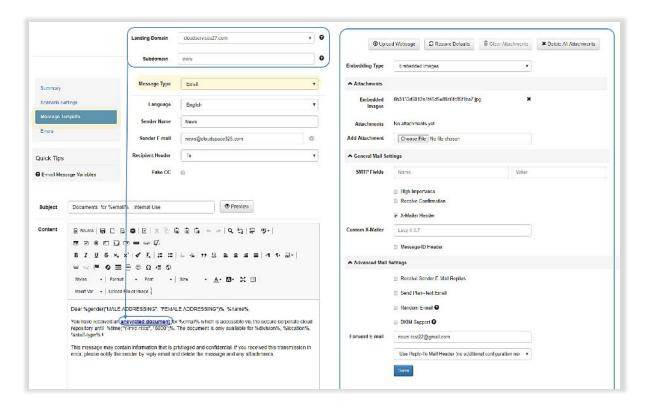


Data entry attacks: Data entry attacks can include one or more web pages that intercept the input of
sensitive information. The available web pages can be easily customized with a LUCY web editor. Additional
editing tools allow you to quickly set up functions such as log-in forms, download areas, etc. without HTML
knowledge.

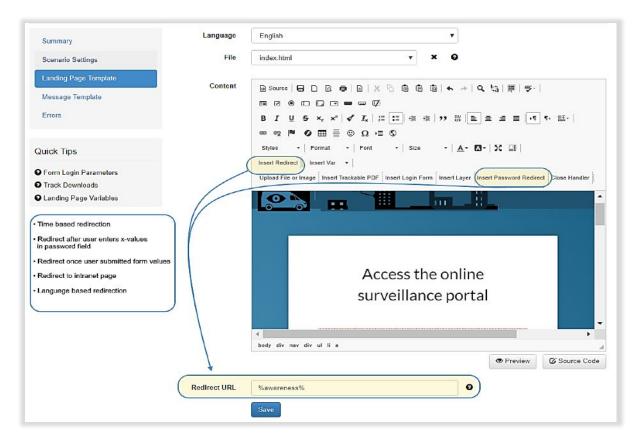




 Hyperlink attacks: A hyperlink-based campaign will send users an e-mail that contains a randomized tracking URL.

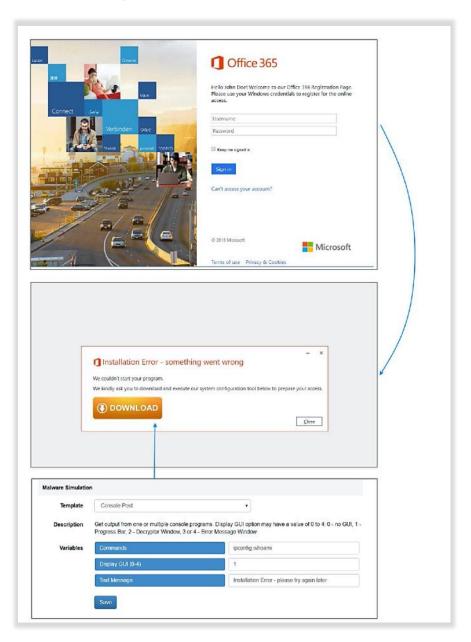


Powerful URL redirection toolkit: LUCY's flexible redirection functions allow the user to be guided, at the
right moment, to the desired areas of attack simulation or training. For example, after entering the first 3
characters of a password in a phishing simulation, the user can be redirected to a special training page about
password protection.



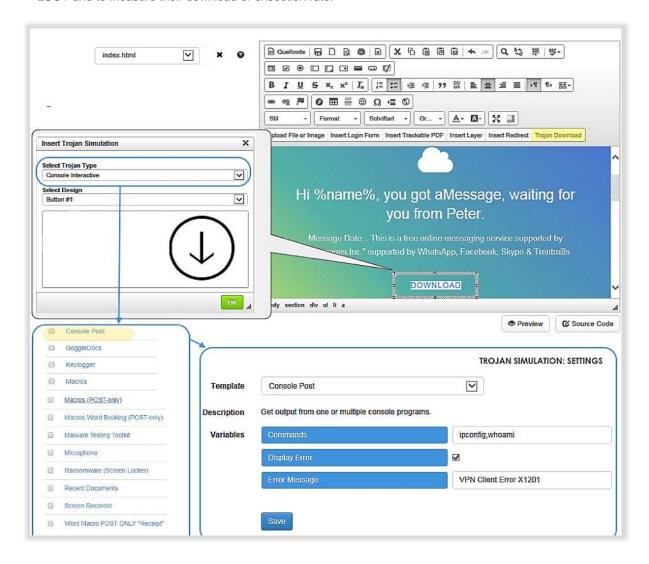


• **Mixed attacks:** Mixed attacks allow a combination of multiple scenario types (file-based, data entry, etc.) in the same campaign.



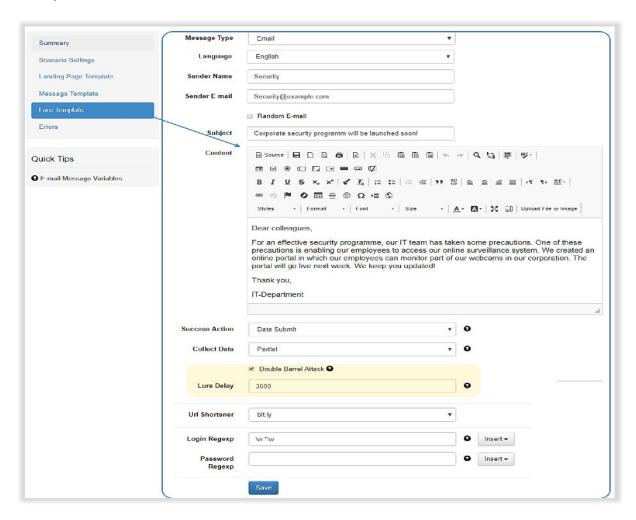


File-based attacks: File-based attacks allow the LUCY administrator to integrate different file types (office
documents with macros, PDFs, executables, MP3s, etc.) into mail attachments or websites generated on
LUCY and to measure their download or execution rate.

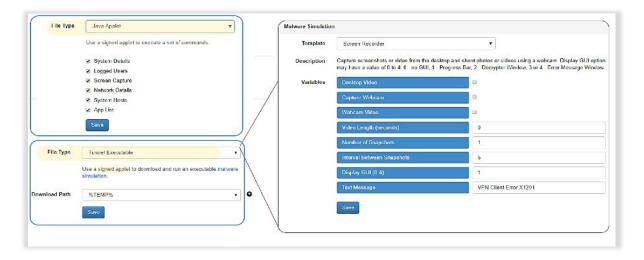




 Double barrel attacks: This feature makes it possible to send multiple phishing e-mails in each campaign, with the first benign e-mail (the bait) containing nothing malicious and not demanding a reply from the recipient.

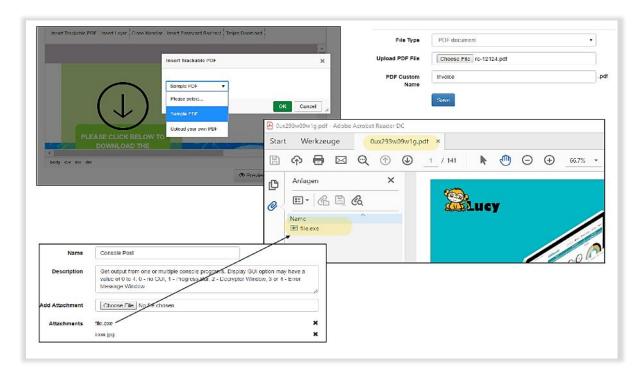


Java-based attacks: Java-based attacks allow the LUCY administrator to integrate a trusted applet within the
file-based or mixed attack templates provided in LUCY and to measure their execution by the user.

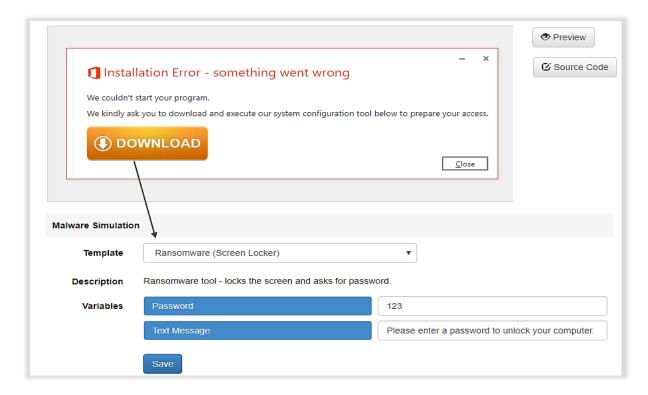




PDF-based attacks: PDF-based phishing attacks can be simulated with this module. LUCY allows "hiding"
executable files as PDF attachments and measuring their execution. Furthermore, dynamic phishing links can
be also generated within PDFs.

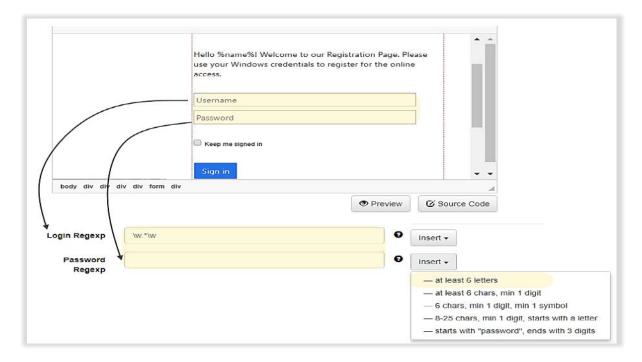


 Ransomware simulation attacks: LUCY has two different ransomware simulations, one of which tests the staff, and the other, the infrastructure.

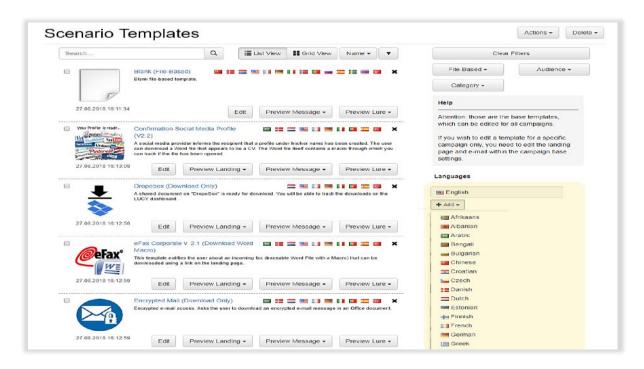




Data entry validation toolkit: In phishing simulations, false positives must be prevented for log-in fields (e.g., logging with invalid syntax). The company guidelines may also forbid the transmission of sensitive data such as passwords. For this purpose, LUCY provides a flexible input filtering engine that offers a suitable solution for every requirement.

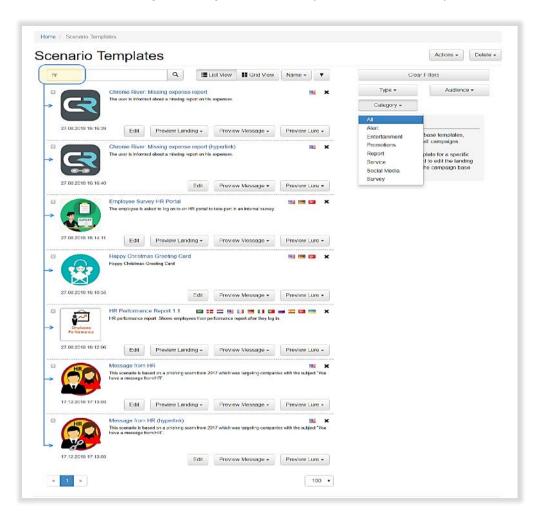


Multilingual Attack Template Library: LUCY comes with hundreds of predefined attack templates in more
than 30 languages in the categories of data entry (templates with a website), file-based (e-mails or websites
with a file download), hyperlink (e-mails with a link), mixed (combination of data entry and download), and
portable media.

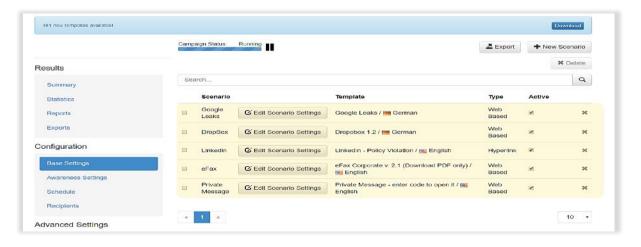




Sector and division specific templates: Attack templates are available for specific industries or divisions.

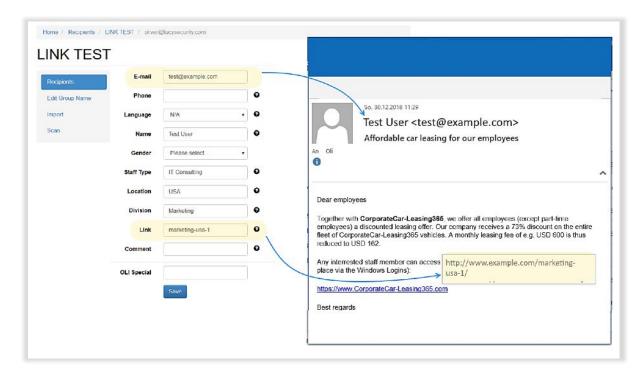


• Simultaneous attack template usage: LUCY gives you the option to use multiple simulated attack templates in a single campaign. Mix the different types (hyperlink, file-based, etc.) with different attack themes to achieve the largest possible risk coverage and a better understanding of employee vulnerabilities. In combination with our scheduling randomizer, complex attack patterns can be executed over a longer period of time.

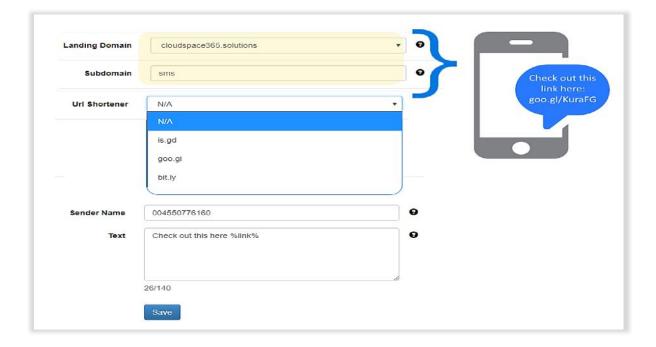




Attack URL variations: Take control of the generated URLs to identify the recipients. Use automated short (< 5 characters) or long URL strings or set individual URLs for each user. The manual URL creation allows you to form links that a user can easily remember. In environments where link clicks are disabled in e-mails, this is a must.</li>

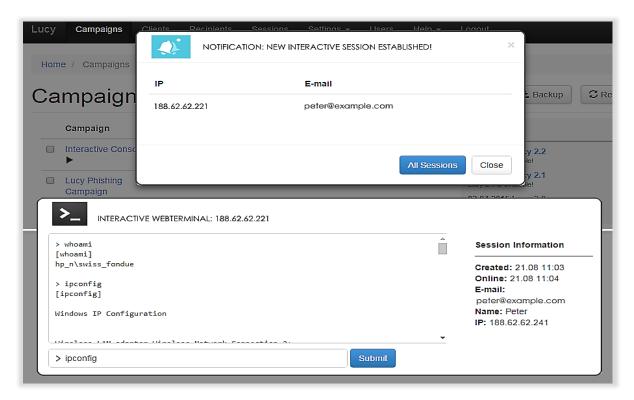


URL shortening: URL shorteners are a relatively new Internet service. As many online social services impose
character limitations (e.g., Twitter), these URLs are very practical. URL shorteners, however, can be used by
cyber criminals to hide the real target of a link, such as phishing or infected websites. For this reason, LUCY
offers the possibility to integrate different shortener services within a phishing or smishing campaign.

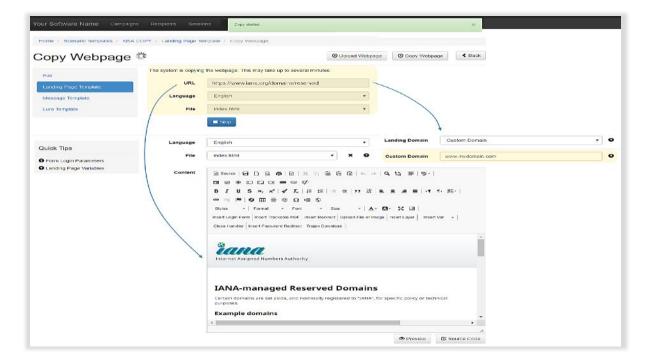




Pentest kit: The pentest kit is a submodule of the malware simulation toolkit and goes by the name
"Interactive Sessions." It allows you to communicate interactively with a client pc that sits behind firewalls by
using reverse http/s connections.

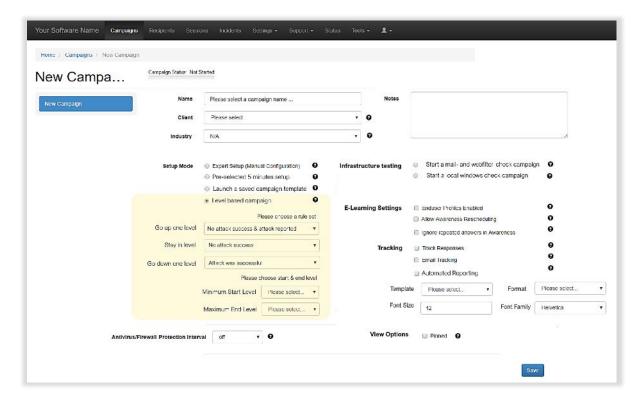


Website cloner: Quickly create highly professional landing pages for your campaigns. Clone existing
websites and add additional layers with data entry fields, files for download, and more.

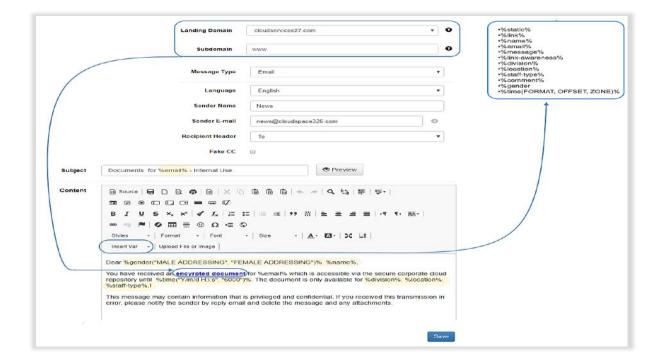




Level-based attacks: Level-based phishing training for employees serves to make the risk of social hacking
measurable. Scientific analysis should also identify the most important risk factors so that individual training
content can be offered automatically.

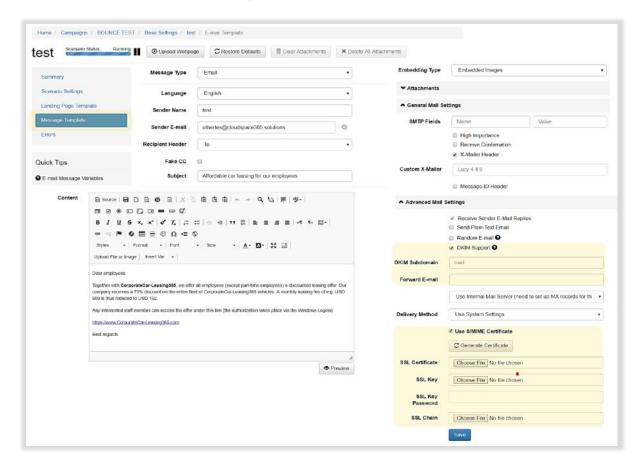


• **Spear phishing simulation:** The Spear Phish Tailoring works with dynamic variables (gender, time, name, email, links, messages, division, country, etc.) which you can use in landing and message templates.

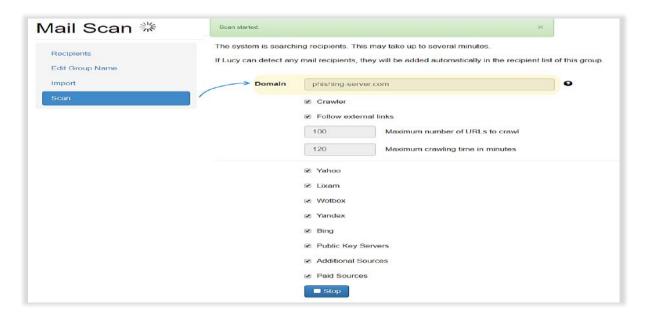




 DKIM / S / MIME Support for Phishing e-Mails: Digital signatures for e-mails: Send signed phishing simulation mails (s/mime). Use DKIM to get a better sender score.

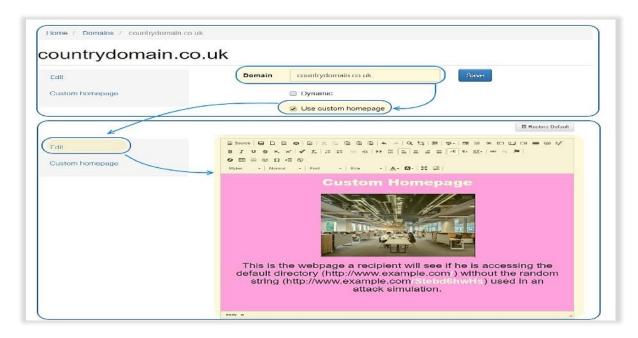


• Mail scanner: Curious which e-mail addresses in your organization can be found on the Internet? Use LUCY's mail scanner and find out what a hacker already knows about your company.



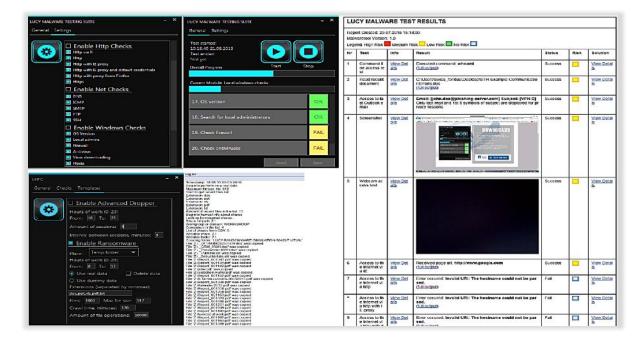


Custom homepage creation: Recipients with a better technical understanding could use their browser to call
the domain or IP address associated with the randomly generated phishing link. To prevent error messages
from appearing or the end user from even coming to the login area of the admin console, you can create
generic "homepages" within LUCY for the domains used in the phishing simulation.



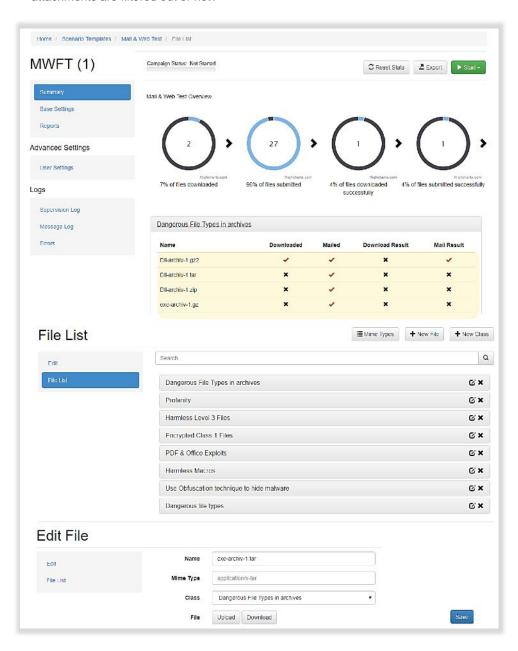
### **TEST INFRASTRUCTURE**

Malware Testing Toolkit: The Malware Simulation Toolkit is an advanced malware simulation suite capable
of emulating various threats. It allows an auditor to access an advanced set of features equivalent to many of
the tools employed by cyber criminals. The tool, therefore, allows the LUCY administrator to perform security
checks without involving employees outside the IT department.



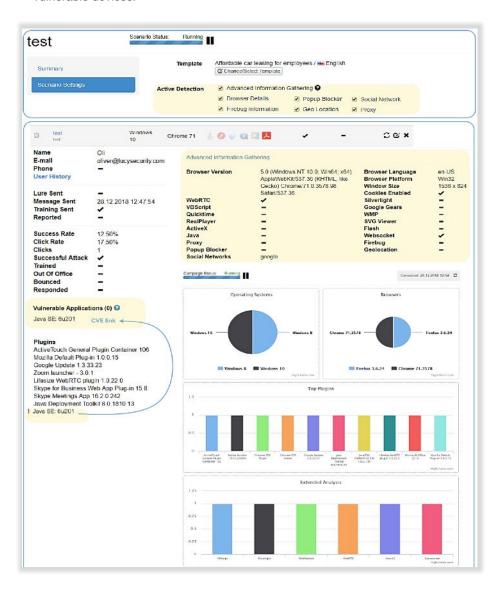


• Mail and Web Filter Test: This functionality provides the answer to one of the most important questions in securing Internet and mail traffic: Which file types can be downloaded from the Web, and which e-mail attachments are filtered out or not?



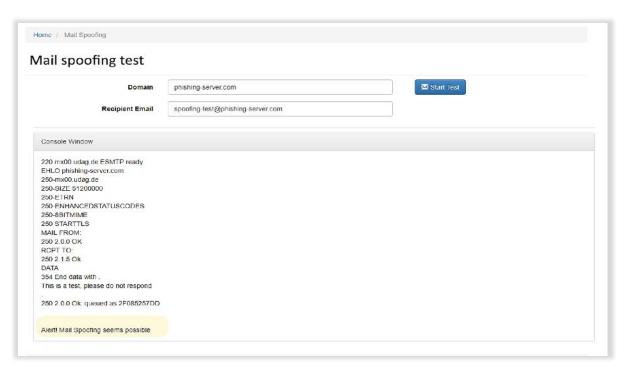


Active and Passive Client Vulnerability Detection: This feature allows local testing of the client browser
and detection of possible vulnerabilities based on custom JavaScript libraries and the browser's user agent
data. The discovered plugins can be automatically compared with the vulnerability databases (CVE) to identify
vulnerable devices.



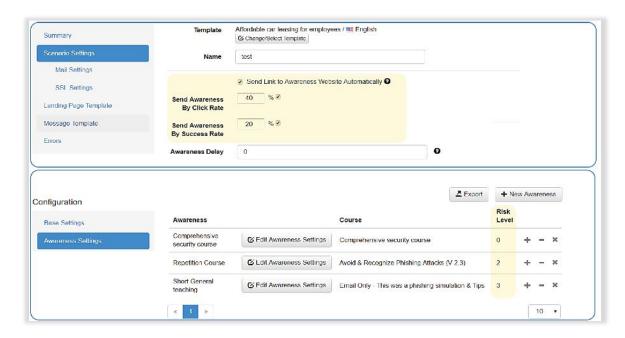


• Spoofing Test: Test your own infrastructure for mail spoofing vulnerabilities.



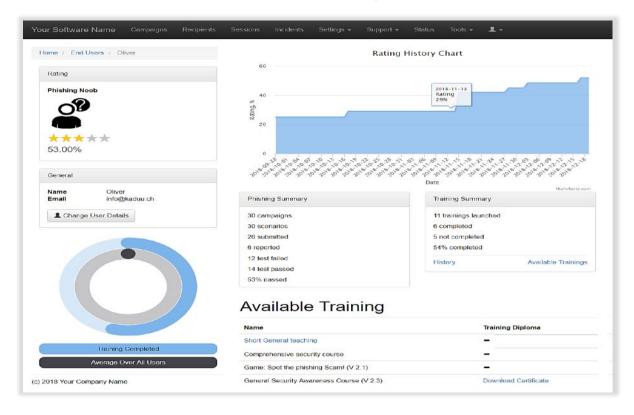
## **TECHNICAL TESTING**

Reputation-Based e-Learning: Train your employees according to their required skills. Measure employee abilities and enable friendly competition between colleagues (gamification).
 Based on the reputation profiles of each end user, the system can automatically provide them with multiple training sessions. The reputation profiles are based, among other factors, on the user's behaviour in phishing simulations. This ensures that users who are repeated offenders receive different training content from those who click on an attack simulation for the first time.





End user Training Portal: Learning Management System (LMS) functionality: Gives each employee
permanent access to a personalized training homepage that features your own courses specifically tailored for
them. On this homepage they can view their performance statistics, resume or repeat training, create course
certificates, and compare their results with other departments or groups.

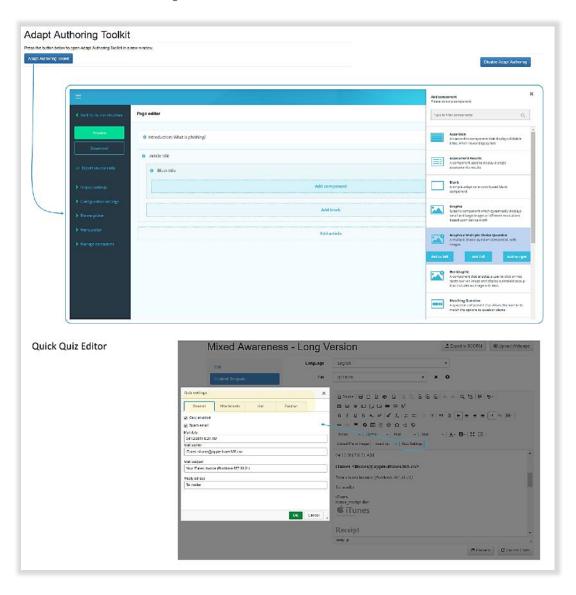


 Awareness Education Diploma: Certificates of e-Learning can be created and printed out by the recipient either directly within a training or inside the LMS portal.



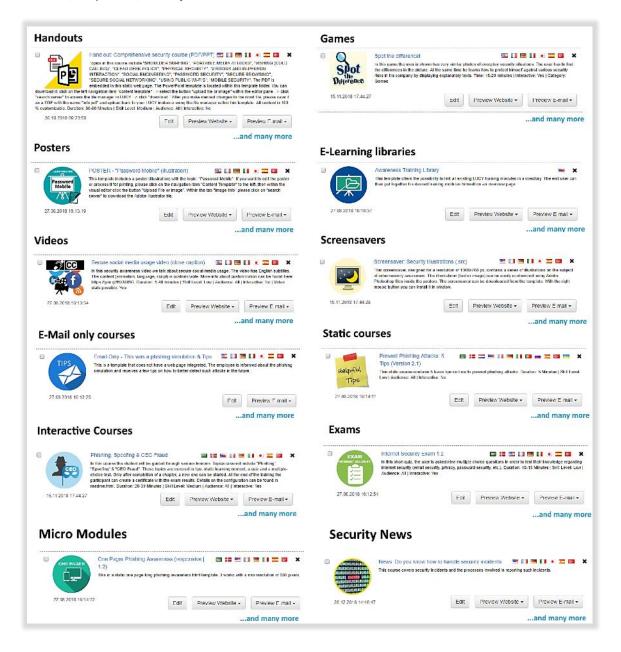


 e-Learning Authoring Toolkit: The e-Learning Authoring Toolkit (Adapt) allows the creation of individualized learning content. Drag and drop videos or any other rich media format, insert exams from pre-defined menus, create interactive e-learning content from scratch in a short time.





 Rich Media Awareness Training: Integrate rich media (video, audio, or other elements that encourage viewers to interact and engage with the content) in your awareness trainings. Use the existing educational videos, adapt them, or add your own rich media.

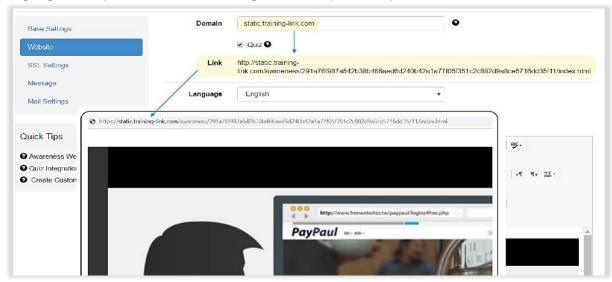




• **Training Library:** Your employees can access your organization's training content from an overview page called "training library." It contains a large selection of LUCY's regular e-learning templates, which serve as input. The overview page can be sorted by certain topics (video, quiz, test, etc.).

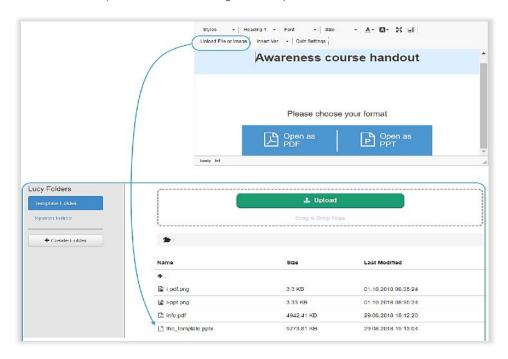


 Static Training Support: Training content can also be published on static pages within LUCY or the intranet, giving the user permanent access to training content, independent of possible attack simulations.

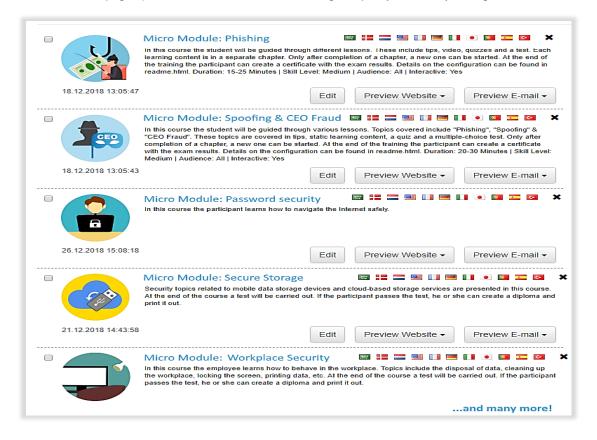




 Offline Training Support: LUCY is supplied with a series of editable templates (Adobe Photoshop or Illustrator files) for awareness training, such as posters, screensavers, fliers, etc.

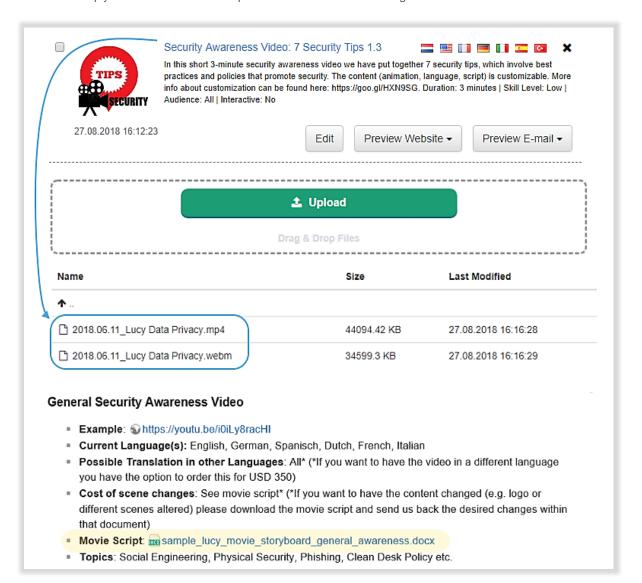


 Microlearning Modules: We have designed microlearning training modules (e.g., 1-minute videos or awareness 1-pagers) that can be tailored to the branding and policy needs of your organization.



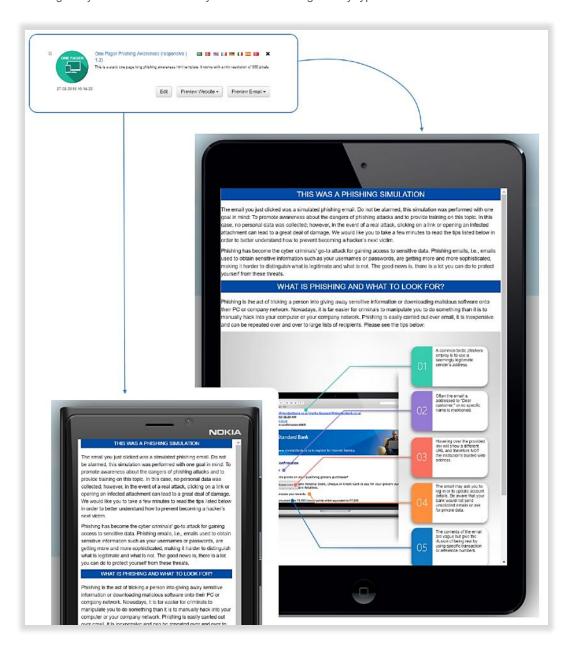


• Video Customization: Send us your company logo and we will include it in the training videos. You want another language? No problem. We will set the video to play in the language you prefer. You want a different scene? Simply download the video scripts and mark the desired changes.



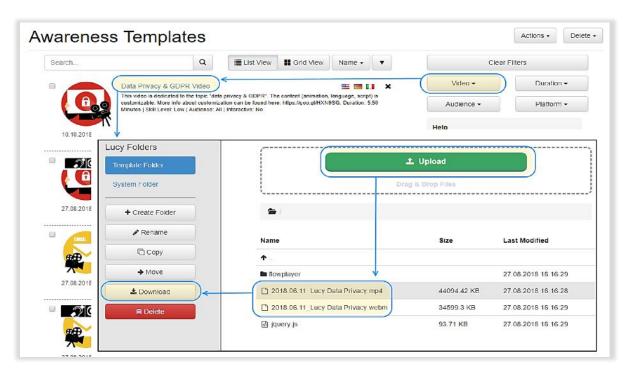


Mobile-Responsive Format: Many of LUCY's built-in modules are available in a mobile-responsive format
that gives your users the flexibility to take the training on any type of connected device.

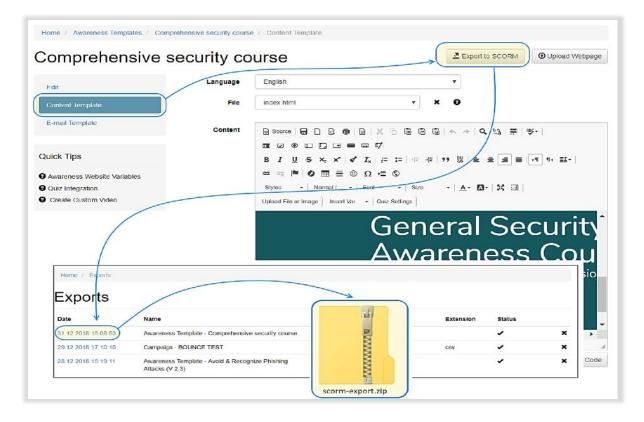




 Video Import/Export: You can export LUCY videos to your own system as well as import your own videos into LUCY.



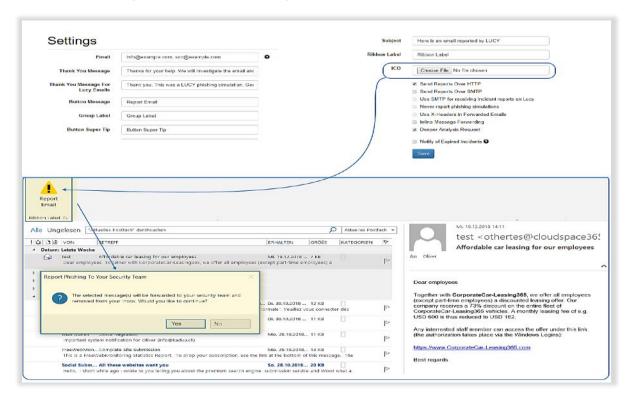
Dynamic Training Hints: The implemented dynamic hints allow your administrator to set markers within the
attack templates that could indicate to your employees, inside the e-learning material, where the phishing
attack may have been detected.



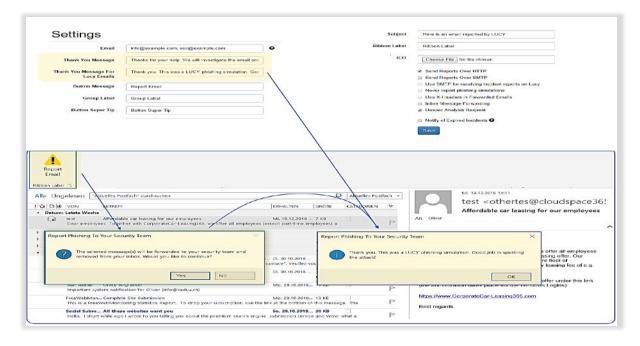


#### **ENGAGE EMPLOYEES**

• Report E-mails with a single click: End users can report suspicious e-mails with a single click to one or multiple e-mail accounts and have them forwarded to your LUCY incident analysis console. Your employees, inside the e-learning material, where the phishing attack may have been detected.

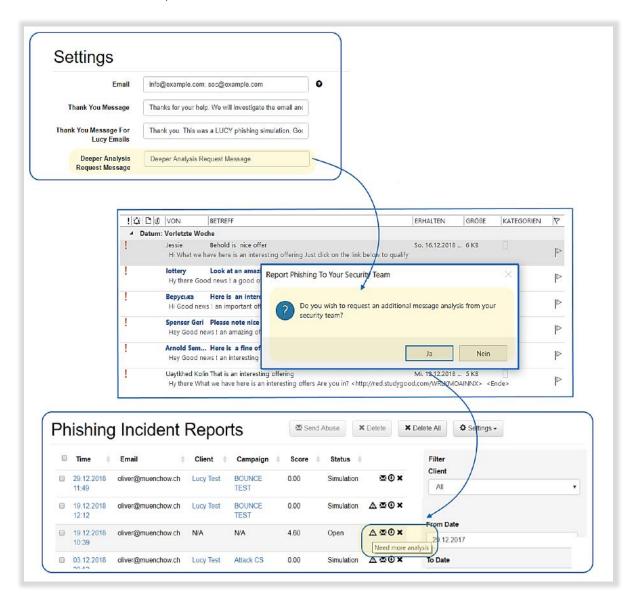


 Positive Behavior Reinforcement: Our plugin automatically provides positive behaviour reinforcement by showing gratitude to end users via a custom message defined by your organization.



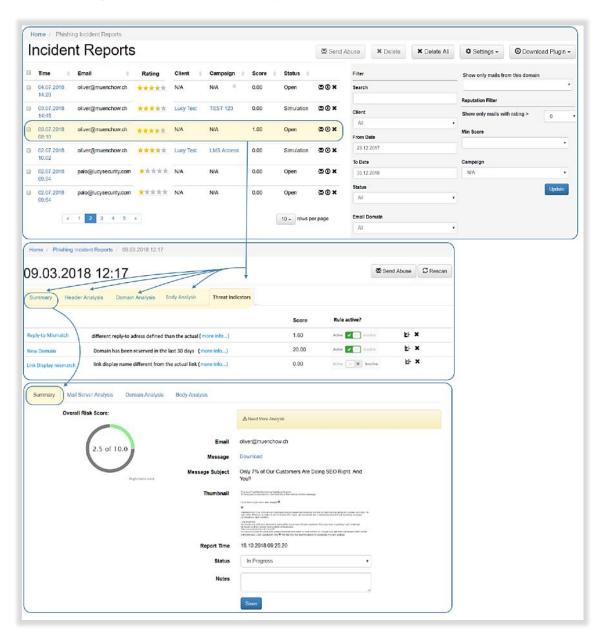


Deep inspection request: Sometimes users want to know if the received e-mail can be opened safely. The
user can optionally use the "deep inspection request" within the local plugin to tell the security team that he
wants feedback on the reported e-mail.



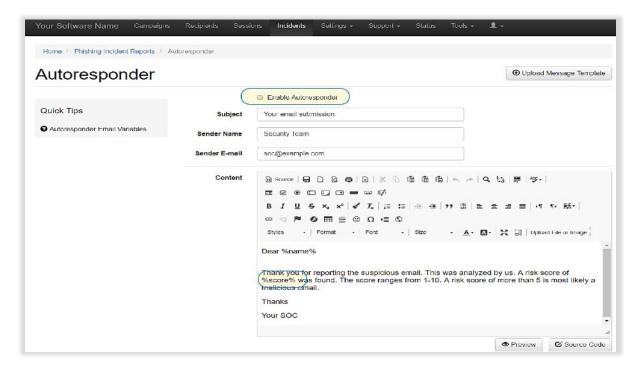


Automatic Incident Analysis: Manage and respond to reported suspicious e-mails using a centralized
management console: LUCY analyzer allows an automated inspection of reported messages (header & body).
The analyzer includes an individual risk score, providing a real-time ranking of reported e-mails. The Threat
Analyzer brings a noticeable relief for the safety team's work load.

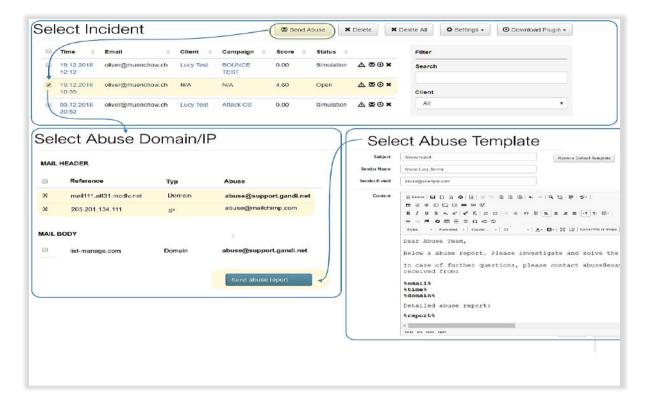




Incident Auto Feedback: The Incident Autoresponder allows sending an automated notification to the end
user providing the results of the e-mail threat analysis. The message text is freely configurable, and the LUCY
E-mail Risk Score can also be included, if required.

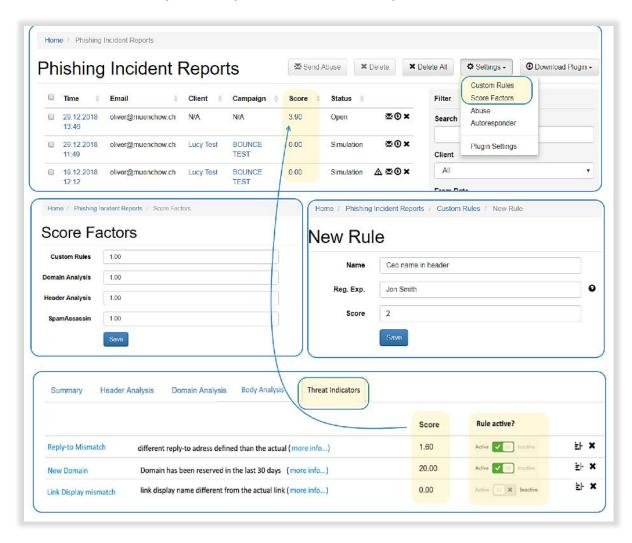


• Threat Mitigation: The behavioural threat mitigator is a revolutionary approach to eliminating e-mail risks. It will support the security admin in shutting down the attack (e.g., sending an automated report to specified abuse team of providers involved in the attack).



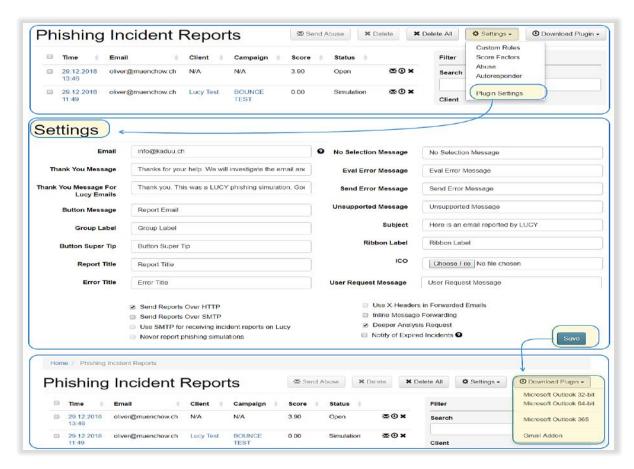


Custom rule-based analysis: Define your own rules for e-mail analysis and risk calculations.

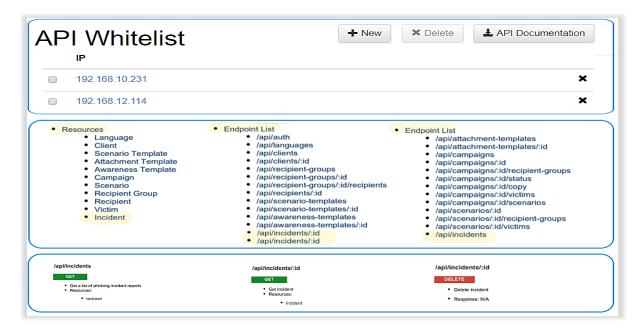




Plugin customization options: LUCY allows an easy customization and a complete white labelling of various
plugin functions (displayed icon, feedback messages, ribbon label, transmission protocol, sent header, etc.).

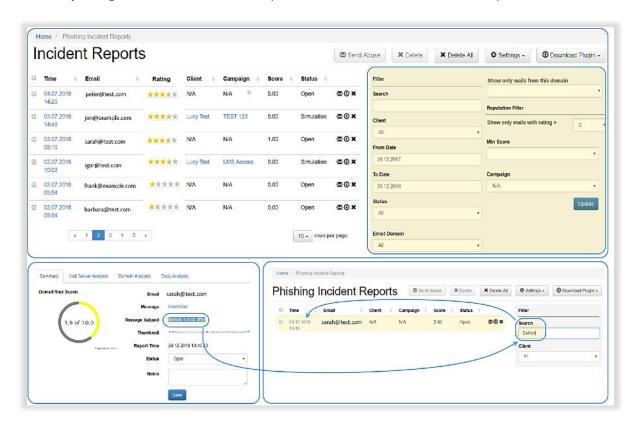


• Third party integration: Using LUCY's incident REST API automation, we can process reported e-mails and help your security team stop active phishing attacks while in progress.

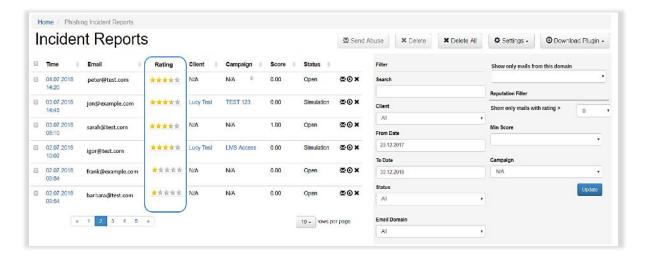




• **Identify attacks with common patterns:** Apply LUCY's dashboard filters to detect common attack vectors across your organization. Search within all reported e-mails for similar indicators of compromise.

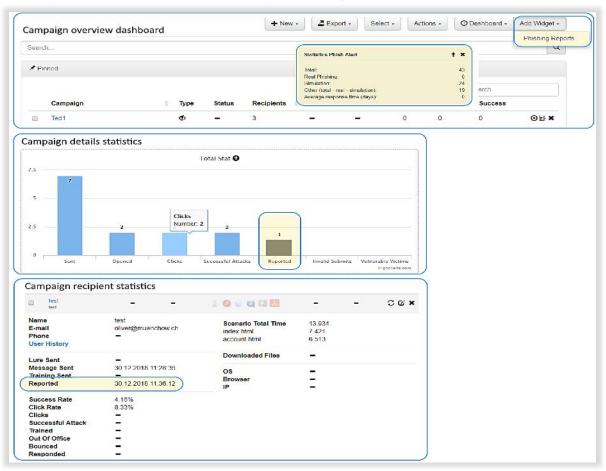


• Incident user reputation profiles: Classify users with an incident reputation score.





• **Integration with attack simulations:** Seamless report and dashboard integration with phishing simulations: identify the users who have behaved exemplarily in a phishing simulation.



• Easy Installation: Install the Phishing Incident Plugin for Outlook, Gmail, Office365.

